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Monthly Report

April 1988 Number 236

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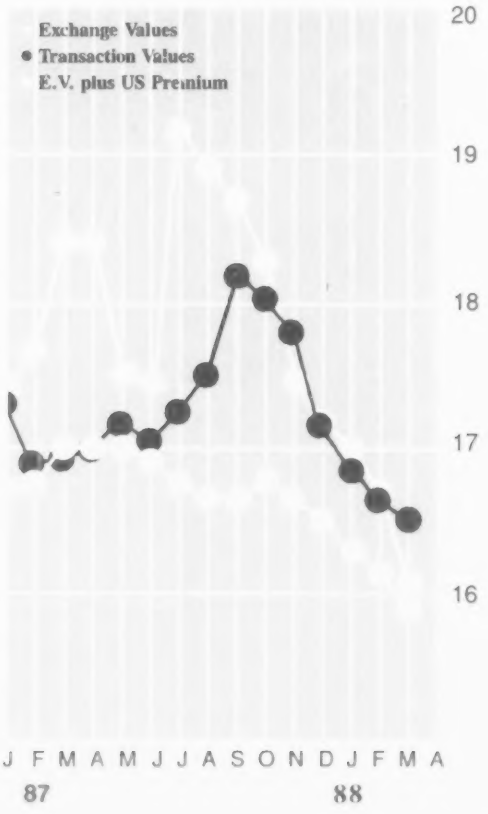

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EXECUTIVE SUMMARY
REPORT 236
(All data as of March 31, 1988)

Exchange Value
$15.90, down $0.25

The **Exchange Value** is **$15.90** per pound U_3O_8, down $0.25 since last month. The US Premium (relative to the Exchange Value) is $0.15, down $0.35 since last month.

UF_6 Value
$45.50, down $0.50

The **UF_6 Value** is **$45.50** per kg U as UF_6, down $0.50 since last month. The US Premium (relative to the UF_6 Value) is $0.50, down $0.75 since last month.

Transactions

Twelve recent natural uranium sales are reported, involving **over 12 million** pounds equivalent U_3O_8. Six of the sales involved spot or near-term delivery, and met the conditions for inclusion in the Transaction Value. Active spot and near-term **uranium supply** amounts to **6.0 million** pounds U_3O_8 equivalent, down 1.1 million pounds since last month. Active spot and near-term **uranium demand** totals **2.5 million** pounds, unchanged from last month. The spot and near-term **supply-demand ratio** decreased to **2.4 to 1**.

Transaction Value
$16.55, down $0.10

The **Transaction Value** is **$16.55** per pound U_3O_8, **down $0.10** since last month. The calculation includes 24 transactions involving a total of 3.1 million pounds U_3O_8 and equivalent UF_6 and covers a period of 4 months.

Loan Rate
3.5%, unchanged

The **Loan Rate** is **3.5 percent** per annum, unchanged. No loan transactions are reported.

Conversion Value
$1.80, unchanged

The **Conversion Value** is **$1.80** per pound U as UF_6, unchanged since last month. Active secondary market supply for conversion services for delivery within three years totals 150,000 pounds U as UF_6. Active demand totals 750,000 pounds U as UF_6. One secondary market conversion transaction is reported.

SWU Value $70, down $3.00

The **SWU Value** at .3% tails assay is **$70** per SWU, down $3.00 since last month. No secondary market SWU transactions are reported.

* * *

Raw Materials

For the past several years, uranium production in France has averaged about 8 million pounds U_3O_8 per year, or about nine percent of the world total in 1987. This article examines the geology, history and organization of the French uranium industry, including the role of Cogema and other companies active in this area.

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NUEXCO REPORT 236 FIGURES OF THE MONTH (March 31, 1988)	This Month (Report 236)	Last Month (Report 235)	12 Months Ago (Report 224)
Exchange Value ($US per pound U_3O_8)	15.90	16.15	17.00
US Premium for the Exchange Value ($US per pound U_3O_8)	0.15	0.50	1.50
UF_6 Value ($US per kg U as UF_6)	45.50	46.00	48.00
US Premium for the UF_6 Value ($US per kg U as UF_6)	0.50	1.25	3.50
Transaction Value ($US per pound U_3O_8 equivalent)	16.55	16.65	16.95
Loan Rate (Per Annum)	3.5%	3.5%	3%
Conversion Value ($US per pound U as UF_6)	1.80	1.80	1.80
Near-Term Uranium Supply[1] (millions of pounds U_3O_8)	6.0	6.6	3.5
Near-Term Uranium Demand[2] (millions of pounds U_3O_8)	2.5	2.5	1.8
Near-Term Supply-Demand Ratio	2.4	2.7	1.9
Recent Uranium Sales:[3]			
Number of Transactions	12	4	10
Quantity of Material (Millions of pounds U_3O_8 equivalent)	12.6	0.4	2.2
Nuexco SWU Value: ($US per SWU)[4]			
at 0.30 tails assay	70	73	77
US DOE SWU Prices: ($US per SWU)			
USEC	117.00[4]	117.00[4]	119.00[5]
AFC	153.00[6]	153.00[6]	153.00[6]
Requirements	157.00[6]	157.00[6]	157.00[6]
Incentive Price	90.00[7]	90.00[7]	90.00[7]
Market Value of Enriched UF_6[8]: ($US per kg U as UF_6)			
2.5 w/o U_{235}	421	433	455
3.0 w/o U_{235}	539	553	582
3.5 w/o U_{235}	658	676	711
4.0 w/o U_{235}	779	801	842

[1]Active inquiries to sell, for delivery within 12 months after contract signing.

[2]Active inquiries to purchase, for delivery within 12 months after contract signing.

[3]Uranium sales only; does not include loans, conversion, or SWU transactions.

[4]Effective since 10/1/87.

[5]Effective since 10/1/86.

[6]Effective since 10/1/84.

[7]Effective since 10/1/86, for up to 30% of annual requirements.

[8]Calculated using the Nuexco Exchange Value, Conversion Value, SWU Value and 0.30 percent tails assay.

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MONTHLY REPORT ON THE NUCLEAR FUEL MARKET

April 1988 - No. 236

R. GENE CLARK, *EDITOR* CHARLES B. LEWIS, *ASSISTANT EDITOR*

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To Our Readers

* * *

It was twenty years ago in April 1968 that **Payne Kibbe** and **George White** formed Nuexco with a business plan that presumed sustained growth in nuclear power. Nuexco's role was originally intended to be that of a banker, earning fees by arranging uranium loans between those with excess inventories and those that had short-term needs. The Nuexco Exchange Value was developed as a basis for settling these loans when the amount of uranium returned differed from the amount borrowed. Over time, as the nuclear industry grew and changed, Nuexco also evolved and took on roles and activities that were quite different and far more complex than those its founders had initially anticipated. Payne died in 1983, and George is now retired, living in Pebble Beach, California, but Nuexco has continued to grow.

That growth is, in large measure, a reflection of the people associated with the firm. One common thread within Nuexco has been the continuity of its personnel. **Bob Wolcott's** tenure as a shareholder and a director dates back to 1968; he later became Chief Executive. **Harold (Lindy) Lindberg** became the first Nuexco representative in 1970, and today, at age 82, remains a valuable daily contributor. Many other current employees, consultants, and representatives also have long service with the firm: **George White, Jr.**, the longest-term employee, has been with the company since 1971; **Kathie Kuziel** and **Don Ebright** since 1974; **Wayne Fowler** since 1975; **Jim Vaughan** since 1976; **Wes Miller** since 1977; **Edward Bee**, **Katie Bowen**, **Chris von Christierson**, and **Kazy Yokota** since 1978; **Bob Alexander**, **Don Radcliffe** and **Bryan Webster** since 1982; and **Chris Guitton**, **Earl Hoellen**, **Jim Lightner** and **Jim Stewart** since 1983. Nuexco's owner, **Oren Benton**, was first involved with Nuexco more than ten years ago, as a client with the Energy Fuels organization. Oren subsequently became a Nuexco director and shareholder in 1983, after his Energy Fuels association had ended.

Equally important to Nuexco's growth and success has been its ability to adjust to a changing market environment. The company's move to Denver brought with it new personnel, talents and disciplines that have allowed for a continuation of the pattern of adjustments to market changes first begun by George and Payne. Even though commercial techniques have evolved and become more sophisticated, Nuexco still deals with excess inventories and unfilled needs, the very problems that led to its formation twenty years ago.

While proud that it has not only survived but demonstrated an ability to grow in a difficult and competitive environment, Nuexco is also keenly aware that its success would not have been possible without the support and demonstrated confidence of its many clients and friends throughout the world.

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March 31, 1988	Market Values	Active Supply[1] (thousands)	Active Demand[1] (thousands)
EXCHANGE VALUE	**$15.90**/lb. U_3O_8	5,960[2]	2,515[2]
US Premium	**$0.15**		
UF_6 VALUE	**$45.50**/kg U as UF_6	5,960[2]	2,515[2]
US Premium	**$0.50**		
CONVERSION VALUE	**$1.80**/lb. U as UF_6	150	750
SWU VALUE			
0.30 tails assay	**$70**/SWU	305	220
LOAN RATE	**3.5%**/annum	7,600	0

TRANSACTION VALUE	$/lb. U_3O_8	Millions of Pounds	Number of Transactions	Number of Months
	16.55	**3.1**	**24**	**4**

[1]Supply and demand tables in the *Current Market Data* section of this Report detail the numbers for each category.
[2]For either uranium concentrates or uranium hexafluoride.

DEFINITIONS

1. The **Exchange Value** is Nuexco's judgment of the price at which transactions for significant quantities of natural uranium concentrates could be concluded as of the date indicated.
2. The **UF_6 Value** is Nuexco's judgment of the price at which spot and near-term transactions for significant quantities of natural uranium hexafluoride could be concluded as of the date indicated.
3. The **Conversion Value** is Nuexco's judgment of the price at which spot and near-term transactions for significant quantities of conversion services could be concluded in the secondary market as of the date indicated.
4. The **SWU Value** is Nuexco's judgment of the price at which spot and near-term transactions for significant quantities of enrichment services could be concluded as of the date indicated.
5. The **Loan Rate** is Nuexco's judgment of the annual interest rate at which uranium loans could be concluded as of the date indicated.
6. The **Transaction Value** is a weighted average price of recent natural uranium sales transactions. The calculation is based on prices paid in:
   a. Transactions closed within the previous three month period for which delivery is scheduled within one year of the transaction date;
   b. At least ten transactions;
   c. Transactions involving a sum total of at least 2 million pounds U_3O_8 equivalent.

   The sample time is extended as necessary to include these minima. Other currencies are converted to US dollars using conversion rates in effect on or near the transaction date.
7. The **US Premium** is Nuexco's judgment of the incremental price (relative to the Exchange Value or UF_6 Value, as applicable) at which transactions for significant quantities of natural uranium could be concluded as of the date indicated, if the buyer will accept only US-origin.

DERIVATIONS AND COMMENTS

1. All Market Values are based on:
   a. Data from recently completed transactions.
   b. Data from pending transactions.
   c. Firm bids to buy or borrow, and firm offers to sell or lend.
   d. Prices purchasers or rates borrowers have expressed a willingness to pay, but for which Nuexco is not aware of firm bids to buy or borrow, and prices sellers or rates lenders have expressed a willingness to accept, but for which Nuexco is not aware of firm offers to sell or lend.
2. Prices associated with deliveries under old or renegotiated contracts or other than arm's-length transactions are not included in the determination of these Market Values.
3. In the determination of prices, Nuexco does not consider transportation charges other than those customarily provided by suppliers.
4. The prices of services or materials delivered under long-term contracts with primary suppliers are not considered in the determination of the listed values.
5. For the SWU Value, Nuexco converts SWU prices at varying tails and product assays to equivalent SWU prices at a tails assay of 0.30 weight percent U^{235} and a product assay of 3.0 weight-percent U^{235}, assuming feed costs corresponding to the Nuexco Exchange and Conversion Values determined as of the same date.
6. In calculating the Transaction Value, Nuexco does not account for the price of uranium delivered in connection with contracts which call for "market price" mechanisms. This exclusion applies particularly to contracts in which delivery prices are expressed as a function of future Exchange Values or any other indeterminate variable. Also excluded from the calculation are any other transactions in which the delivery price is defined in such a way that it cannot currently be determined.

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NATURAL URANIUM AND SECONDARY MARKET CONVERSION

(All data as of March 31, 1988)

The **Exchange Value** is **$15.90** per pound U_3O_8, down $0.25 since last month. US-origin U_3O_8 is commanding a **premium** (relative to the Exchange Value) of **$0.15** per pound U_3O_8 (down $0.35). .

Active supply of natural uranium (concentrates and UF_6) for spot or near-term delivery totals **5,960,000** pounds U_3O_8 equivalent, down 680,000 pounds since last month. The corresponding figure for **active demand** is **2,515,000** pounds, up 15,000 pounds. The spot and near-term supply-demand ratio is 2.4, down from 2.7 at the end of February.

The *Current Market Data* section of this Report lists twelve natural uranium sales, totaling approximately 12 million pounds U_3O_8 equivalent. Six of those involved near-term delivery and met the criteria for inclusion in the Transaction Value calculation. All of the transactions involved concentrates.

The **Transaction Value** is **$16.55** per pound U_3O_8, down $0.10 since last month. The calculation extends over a 4-month period and includes 24 transactions involving 3.1 million pounds equivalent U_3O_8.

The **UF_6 Value** is **$45.50** per kilogram U in UF_6, down $0.50. The premium for US-origin UF_6 is **$0.50** per kilogram U (down $0.75). No transactions involving UF_6 are reported.

The **Conversion Value** is **$1.80** per pound U as UF_6, unchanged since last month. Active supply of secondary market conversion services totals 150,000 pounds U as UF_6. Active demand totals 750,000 pounds U as UF_6. One secondary market conversion transaction is reported.

The **Loan Rate** is **3.5 percent** per annum, unchanged since last month. No loan transactions are reported.

* * *

The **Exchange Value** declined $0.25, to $15.90 per pound U_3O_8 this month. The U_3O_8 market showed some renewed activity in March, and the combination of aggressive sellers' offers and limited, largely discretionary demand caused downward pressure on prices. Six spot or near-term transactions are reported this month, totaling over 600,000 pounds U_3O_8 equivalent; all of these sales involved US-origin concentrates. In addition, six long-term transactions are reported, totaling over 12 million pounds U_3O_8 equivalent, all involving concentrates.

Spot market demand for concentrates consisted primarily of US utilities considering discretionary purchases, and during the month at least four US utilities purchased US-origin material. Near the end of the month, several US producers had lowered prices to near the $16.00 level as they competed to sell a significant quantity of material to one US utility.

This competition caused the **Premium** (relative to the Exchange Value) for US-origin U_3O_8 to drop in March, declining $0.35 to $0.15. The price for US-origin concentrates has now dropped to the point where most buyers in the USA will purchase US-origin material in preference to non-US-origin. In such a situation, sellers of non-US-origin material could be forced into another round of price cuts if they wish to compete in the US market, at least until the uncertainties overhanging the market for US-origin material are resolved.

On March 30, the US Senate passed the Uranium Revitalization, Tailings Reclamation and Enrichment Act (S. 1846) by a margin of 62-28. The bill includes an amendment mandating certain restrictions on imports of non-US-origin uranium. Although the bill's eventual passage by the House of Representatives and its signature into law by President Reagan remain questionable, the Senate's passage did revive some US producers' hopes that uranium import restrictions would eventually be imposed. The bill was passed too late in March, however, to affect the month's transactions; any impact on US producers' offering prices remains to be seen.

Despite the progress of the uranium revitalization bill, the market for US-origin concentrates is likely to reflect the current state of uncertainty until at least June, when the Supreme Court is expected to issue its ruling in the US Producers vs. DOE lawsuit. The US-Canada Free Trade Agreement's (FTA) eventual implementation also remains in doubt, as various special interest groups, members of Congress, and the Administration seek a workable package of implementing legislation that will be acceptable to all parties on the US side. Canadian support of the FTA may decline in the event the uranium legislation is passed into law. Technically, the FTA specifies that Canadian uranium be exempt from restrictions under Section 161(v) of the Atomic Energy Act (the basis of the producers' lawsuit) but says nothing about restrictions based on any other law (such as the uranium legislation).

The **UF_6 Value** declined $0.50 to $45.50 per kg U as UF_6 during March. The market for natural UF_6 was unusually

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dormant during the month, and no transactions are reported. At the end of March, one US utility and one European utility were interested in purchasing natural UF_6, and several other potential buyers had expressed interest in or were evaluating offers for enriched uranium, although none had specified US-origin. Active supply of UF_6 is relatively weak, and little US-origin material is available for sale. However, the very limited demand for UF_6 at present has contributed to the downward pressure on prices.

The **Premium** (relative to the UF_6 Value) for US-origin UF_6 declined $0.75 to $0.50 per kg U as UF_6. Since relatively little US-origin UF_6 is available for sale, compared to the level of U_3O_8, and demand for US-origin also is very weak, prices could be vulnerable to large blocks of demand that may appear in the market. In such a market, small quantities of material might be obtained at prices below the UF_6 Value, but larger lots are likely to strain the available supply, which could lead to buyers paying somewhat higher prices.

* * *

The **Loan Rate** remained unchanged this month, at 3.5 percent per annum. Loan supply remains large, but no firm demand exists at the present time. No loan transactions are reported this month.

* *

The **Conversion Value** is unchanged at $1.80 per pound U as UF_6. One US utility currently is evaluating offers for secondary market conversion, but this demand is largely discretionary. One secondary market conversion transaction is reported this month, at a price slightly above this month's Conversion Value; this transaction reflects the higher prices paid in Europe for conversion services, compared to those in North America.

ENRICHED URANIUM AND SWU

The **SWU Value** is $70 per SWU, down $3 since last month as a result of competition for a few sales opportunities. Most of the near-term SWU demand comes from three utilities, all seeking SWU contained in enriched uranium. One of those buyers is expected to buy a significant quantity within the next two months, and the others are interested in much smaller quantities. Because most potential SWU buyers presently are interested in enriched uranium, considerable competition by sellers offering material in that form has added downward pressure on SWU prices. No SWU transactions are reported this month.

* * *

USEC Contract Terminations

April 1, 1988 was the deadline for DOE customers that wanted to reduce or terminate their commitments under the US Enrichment Contract (USEC) to less than 70 percent of their reactor requirements without penalty for the DOE Fiscal Years 1996 through 1998.

While the USEC normally requires 10-years notification for termination without penalty, for the past three years DOE has extended the notification period. The reason given for the extension was to allow DOE customers to postpone their decision on further contracting under the USEC until the issues of the uranium producer's lawsuit, the TVA demand charges, and recovery of the enrichment enterprise's prior costs were resolved.

The real reason behind the extension could have been DOE's desire not to officially recognize any loss of future business. DOE's pricing policy requires it to recover projected costs for the next ten years, based on projected sales; as long as the USEC customers did not formally terminate, they could be included in the sales projections. However, once termination notices had been received, the smaller customer base probably would require DOE to raise SWU prices, an unattractive option at a time when it perceived intense competition from foreign suppliers.

This year, DOE announced its intention not to extend the notification period, thus requiring its customers to make a decision on DOE SWU supply for FY 1996-98. While DOE did not disclose the reasons behind its decision, one of the major factors was the weakness of the US dollar, which has lost much of its value against the currencies of the European SWU suppliers in the last three years. While some of the European suppliers' costs are dollar-based, overall, those suppliers are not nearly as cost-competitive as they were, reducing their ability to aggressively compete for DOE's customers.

DOE has insisted that loyal customers will get a better deal than those who terminate and then try to contract with DOE later. DOE's detractors have asserted that in 1984, DOE also promised better treatment to those who signed

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up for the USEC, and later offered more favorable terms to the holdouts. To those who argued that it was not necessary to contract ten years in advance in an industry which would be characterized by oversupply, DOE threatened to shut down another enrichment plant if a significant fraction of their customers declined to sign. In addition, DOE's foreign competition did not mount an effective campaign to encourage defection from DOE contracts until very recently, when Urenco apparently overcame a reluctance to contract far into the future and began making offers to US utilities for the late 1990s. SWU from the USSR were also offered, but most US utilities currently are unwilling to contract with the USSR.

Nuexco's information to date indicates that DOE's approach may have succeeded. In the USA, DOE had about 42 customers with USEC contracts, representing a potential demand of approximately 10 million SWU per year in FY1996. It appears that six of these customers have terminated all of their FY1996-98 commitments and three other customers have reduced their commitments to below the 70-percent level. As shown in Table 1, these terminations represent a total of 2.3 million SWU per year, or slightly above 20 percent of the US market for SWU. Another 20 percent of the US market, representing the 30 percent of commitments that the remaining USEC contract holders can cancel with only five years notice, remains effectively uncommitted for FY1996 to FY1998. Approximately 10 percent of the US market did not sign the USEC, leaving DOE with firm commitments for 50 percent of the US demand for these years.

Considering that none of the US utilities which terminated their USEC contracts have made firm commitments to other suppliers, and several of those which terminated have expressed a desire to return to DOE under certain conditions, it would appear that DOE has been successful in maintaining its own market niche. Much of its success can be attributed to DOE's own efforts, as it appeared that in the case of at least another six utilities, whose fuel managers recommended termination to their management, those managers were overruled after intense, high-level DOE lobbying. It remains to be seen what impact the terminations will have on DOE's pricing calculations, but the relative impact of the terminations is small compared to the magnitude of some congressional demands for cost recovery.

The outcome for DOE in Europe was not as successful, but that could be expected considering the bias toward European sources of supply. DOE started with European USEC customers representing a little more than 1 million SWU per year in the mid-1990s, or slightly less than 10 percent of the potential demand of about 13 million SWU. Nuexco believes DOE received one total and two partial terminations, representing about 30 percent of its previous European commitments. The terminated commitments are likely to be met by Western European and Soviet suppliers.

In the Far East, DOE reportedly did not receive any terminations as of April 1. The majority of the demand in the Far East comes from Japan, where the special circumstances of the US-Japan nuclear cooperation agreement may have led to an extension of the notification period.

Table 1

RESULTS OF DOE USEC CUSTOMER TERMINATION NOTICES FOR FISCAL YEARS 1996 to 1998
(Millions of SWU)

Region	USA	Europe	Far East
Projected Total Annual Demand	10.5	13	6
Annual Demand under USEC Prior to 4/1/88	9.6	1.1	5
Annual Demand Terminated on 4/1/88	2.3	0.3	—

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EXCHANGE VALUE EXPRESSED IN SELECTED PRODUCER & CONSUMER CURRENCIES[1]

Country (currency)	per lb. U_3O_8 as Concentrates			per kg U as Concentrates		
	This Month (Mar 31, 1988)	Last Month (Feb 29, 1988)	12 Months Ago (Mar 31, 1987)	This Month (Mar 31, 1988)	Last Month (Feb 29, 1988)	12 Months Ago (Mar 31, 1987)
Australia (dollar)	21.51	22.45	24.16	55.91	58.35	62.82
Belgium (comm. franc)	555.56	570.07	633.86	1,444	1,482	1,648
Canada (dollar)	19.64	20.40	22.22	51.07	53.03	57.77
EEC (ecu)	12.80	13.20	14.80	33.27	34.33	38.47
Finland (markka)	63.83	65.95	75.35	165.94	171.44	195.91
France (franc)	89.53	92.29	101.86	232.75	239.92	264.81
FRG (mark)	26.40	27.26	30.54	68.64	70.87	79.39
Italy (lira)	19,557	20,092	21,862	50,844	52,235	56,837
Japan (yen)	1,984	2,073	2,484	5,157	5,389	6,457
Netherlands (guilder)	29.66	30.60	34.57	77.12	79.56	89.87
South Africa (rand)	33.82	33.51	34.07	87.93	87.11	88.57
Spain (peseta)	1,770	1,841	2,157	4,603	4,786	5,607
Sweden (krona)	93.92	96.65	107.32	244.16	251.26	279.02
Switzerland (franc)	21.79	22.42	25.48	56.65	58.30	66.24
UK (pound)	8.45	9.11	10.58	21.97	23.68	27.49
US (dollar)	15.90	16.15	17.00	41.34	41.99	44.20

TRANSACTION VALUE EXPRESSED IN SELECTED PRODUCER & CONSUMER CURRENCIES[1]

Country (currency)	per lb. U_3O_8 as Concentrates			per kg U as Concentrates		
	This Month (Mar 31, 1988)	Last Month (Feb 29, 1988)	12 Months Ago (Mar 31, 1987)	This Month (Mar 31, 1988)	Last Month (Feb 29, 1988)	12 Months Ago (Mar 31, 1987)
Australia (dollar)	22.39	23.14	24.09	58.20	60.16	62.64
Belgium (comm. franc)	578.27	587.72	631.99	1,503	1,528	1,643
Canada (dollar)	20.45	21.03	22.15	53.16	54.67	57.60
EEC (ecu)	13.32	13.61	14.76	34.63	35.39	38.36
Finland (markka)	66.44	67.99	75.13	172.73	176.75	195.33
France (franc)	93.19	95.14	101.56	242.27	247.35	264.03
FRG (mark)	27.48	28.11	30.45	71.45	73.07	79.16
Italy (lira)	20,357	20,714	21,798	52,923	53,852	56,670
Japan (yen)	2,065	2,137	2,476	5,368	5,556	6,438
Netherlands (guilder)	30.88	31.55	34.47	80.27	82.03	89.60
South Africa (rand)	35.21	34.54	33.97	91.53	89.81	88.31
Spain (peseta)	1,843	1,898	2,150	4,791	4,935	5,590
Sweden (krona)	97.76	99.64	107.01	254.14	259.04	278.20
Switzerland (franc)	22.68	23.12	25.40	58.96	60.10	66.05
UK (pound)	8.80	9.39	10.54	22.87	24.41	27.41
US (dollar)	16.55	16.65	16.95	43.03	43.29	44.07

[1]Calculated using currency exchange rates published in the *Wall Street Journal* on the last working day of the month.

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CURRENT MARKET DATA

CONVERSION VALUE EXPRESSED IN SELECTED PRODUCER & CONSUMER CURRENCIES[1]

Country (currency)	per lb U as UF_6			per kg U as UF_6		
	This Month (Mar 31, 1988)	Last Month (Feb 29, 1988)	12 Months Ago (Mar 31, 1987)	This Month (Mar 31, 1988)	Last Month (Feb 29, 1988)	12 Months Ago (Mar 31, 1987)
Australia (doliar)	2.43	2.50	2.56	5.37	5.52	5.64
Belgium (comm. franc)	62.89	63.54	67.11	138.66	140.07	147.96
Canada (dollar)	2.22	2.27	2.35	4.90	5.01	5.19
EEC (ecu)	1.45	1.47	1.57	3.19	3.24	3.45
Finland (markka)	7.23	7.35	7.98	15.93	16.20	17.59
France (franc)	10.14	10.29	10.78	22.34	22.68	23.78
FRG (mark)	2.99	3.04	3.23	6.59	6.70	7.13
Italy (lira)	2,214	2,239	2,315	4,881	4,937	5,103
Japan (yen)	224.55	231.04	262.97	495.05	509.35	579.74
Netherlands (guilder)	3.36	3.41	3.66	7.40	7.52	8.07
South Africa (rand)	3.83	3.73	3.61	8.44	8.23	7.95
Spain (peseta)	200.42	205.20	228.34	441.86	452.38	503.40
Sweden (krona)	10.63	10.77	11.36	23.44	23.75	25.05
Switzerland (franc)	2.47	2.50	2.70	5.44	5.51	5.95
UK (pound)	.96	1.02	1.12	2.11	2.24	2.47
US (dollar)	1.80	1.80	1.80	3.97	3.97	3.97

SWU VALUE AND UF_6 VALUE EXPRESSED IN SELECTED PRODUCER & CONSUMER CURRENCIES[1]

Country (currency)	SWU Value at 0.30% tails assay (Mar 31, 1988)	UF_6 Value per kg U as UF_6 This Month (Mar 31, 1988)	UF_6 Value per kg U as UF_6 Last Month (Feb 29, 1988)
Australia (dollar)	94.68	61.54	63.93
Belgium (comm. franc)	2,446	1,590	1,624
Canada (dollar)	86.48	56.21	58.09
EEC (ecu)	56.34	36.62	37.61
Finland (markka)	281.01	182.65	187.83
France (franc)	394.14	256.19	262.85
FRG (mark)	116.24	75.55	77.65
Italy (lira)	86,101	55,966	57,228
Japan (yen)	8,733	5,676	5,904
Netherlands (guilder)	130.60	84.88	87.17
South Africa (rand)	148.90	96.78	95.439
Spain (peseta)	7,794	5,066	5,244
Sweden (krona)	413.47	268.75	275.28
Switzerland (franc)	95.93	62.35	63.87
UK (pound)	37.20	24.18	25.94
US (dollar)	70.00	45.50	46.00

[1]Calculated using currency exchange rates published in the *Wall Street Journal* on the last working day of the month.

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RECENT TRANSACTIONS[1]

Uranium Sales

Nuexco Transaction Number	Delivery Period	Approximate Quantity (thousands of pounds, U_3O_8 equivalent)	Approximate Price Range as Percent of Current Exchange or UF_6 Value[2]	Seller	Buyer	Remarks
4268	1989-1993	1,001 - 1,500	see Remarks	Producer	Utility	Price related to market, with ceiling
4269	1991-1995	301 - 600	R[3]	Producer	Utility	US-Origin
4272	1990-1994	601 - 1,000	see Remarks	Producer	Utility	Price related to market, with ceiling
4273	1988-1991	3,001 - 5,000	see Remarks	Producer	Utility	Price related to market, with ceiling (late 1987 transaction)
4278	1988	101 - 300	98-102	Producer	R[3]	US-Origin
4279	1988-1997	1,501 - 3,000	R[3]	Producer	Utility	
4281	1988	50 - 100	98-102	Intermediary	Utility	US-Origin
4282	1988	less than 50	98-102	Intermediary	Utility	US-Origin
4283	1989	50 - 100	98-102	Intermediary	Utility	US-Origin
4286	1988	50 - 100	98-102	Producer	Utility	US-Origin
4287	1990-1994	1,501 - 3,000	see Remarks	Producer	Utility	Price related to market
4288	1988	101 - 300	98-102	Producer	Utility	US-Origin

[1] Trar sactions listed are not limited to those in which Nuexco was involved, but also include others of which Nuexco is aware.
[2] Where US-origin material is involved, the range is based on the Exchange Value (or UF_6 Value) *plus* the premium (relative to the Exchange Value or UF_6 Value). The range reflects five percentage points (inclusive) per grouping, centered about the middle of the range.
[3] The notation R means that Nuexco either does not know, or that Nuexco has restricted that information to protect client or source confidentiality.

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CURRENT MARKET DATA

Conversion Services
Secondary Market Sales

Nuexco Transaction Number	Delivery Period	Approximate Quantity (thousands of pounds, U equivalent)	Approximate Price Range as Percent of Current C.V.	Seller	Buyer	Remarks
4284	1988	101 - 300	112-117	Intermediary	Utility	

[1] Transactions listed are not limited to those in which Nuexco was involved, but also include others of which Nuexco is aware.

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URANIUM SUPPLY
(March 31, 1988)

Nuexco Project Number	Delivery Period[1] (Thousands of Pounds U_3O_8) Spot or Near-term[2]	Intermediate or Long-term	Remarks
Available for Sale:			
ACTIVE			
87-1002	270	—	
87-1005	200	400 per year	1988-95
87-1023	500	500 per year	1988-90
87-1061*	700	200 per year	U_3O_8 or UF_6, 1988 on
87-1123	400	—	
87-1130*	550	—	
87-1141	500	200 per year	1989-92
87-1152	200	—	
87-1159	60	—	
87-1161	1,000	1,000 per year	
88-1000*	160	—	U_3O_8 or UF_6
88-1001	200	—	1988
88-1026*	250	—	1988
88-1033A*	130	—	1988, UF_6
88-1036	100	—	1988
88-1041*	740	—	UF_6
87-1001	—	400 per year	1989 on
TOTAL:	5,960		
INACTIVE			
87-1053	100	400 per year	1989 on
87-1135*	260	—	UF_6
87-1136*	260	—	UF_6
87-1156*	825	—	
87-1019	—	600 per year	1988-91
TOTAL:	1,445		

*New or revised since last month.
[1]Measured from the date of this Report.
[2]For delivery within one year. This category excludes material deliverable within one year under other than spot or near-term contracts.
Projects removed since last month: 87-1017.

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CURRENT MARKET DATA

URANIUM DEMAND
(March 31, 1988)

Nuexco Project Number	Delivery Period[1] (Thousands of Pounds U_3O_8) Spot or Near-term[2]	Intermediate or Long-term	Remarks
Inquiries to Purchase:			
ACTIVE			
87-1040	700	300	1989, UF_6
87-1121	650	650 per year	1988-96
88-1013A	150	—	1988, UF_6e
88-1017A	750	—	1988, UF_6e
88-1035A	40	—	1988, UF_6e
88-1045*	225	525	1989-90, UF_6
87-1013	—	1,200 per year	1990-95
87-1021	—	200 per year	1992 on
87-1134	—	260	1989
87-1172	—	500 per year	1990 on
88-1044	—	2,400	1991-95
88-1056*	—	500 per year	1989-93, U_3O_8 or UF_6
TOTAL:	2,515		
INACTIVE			
87-1154A	80	—	1988, UF_6e
87-1163	160	—	1989-92
88-1014	190	—	1988
87-1166	—	650	1989, UF_6
TOTAL:	430		

*New or revised since last month.
[1]Measured from the date of this Report.
[2]For delivery within one year. This category excludes material deliverable within one year under other than spot or near-term contracts.
Projects removed since last month: 87-1108, 87-1146, 88-1022, 88-1024.

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LOAN SUPPLY AND DEMAND
(March 31, 1988)

Nuexco Project Number	Delivery Period[1] (Thousands of Pounds U_3O_8) Within 1 Year	Beyond 1 Year	Remarks
Available for Loan:			
ACTIVE			
87-1012	2,000	—	
87-1071	1,000	—	UF_6
87-1157	4,000	—	
88-1057*	600	—	
TOTAL:	7,600		
INACTIVE			
87-1031	1,000	—	
87-1033	1,000	—	
TOTAL:	2,000		

*New or revised since last month.
[1]Measured from the date of this Report.
Projects removed since last month: 87-1064, 87-1167.

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CURRENT MARKET DATA

CONVERSION SUPPLY AND DEMAND
(March 31, 1988)

Nuexco Project Number	Delivery Period[1] (Thousands of Pounds U as UF_6) Within 3 Years	Beyond 3 Years	Remarks
Available for Sale:			
ACTIVE			
88-1004	150	—	
TOTAL:	150		
INACTIVE			
87-1008	750	750	
TOTAL:	750		
Inquiries to Purchase:			
ACTIVE			
88-1034*	750	—	
TOTAL:	750		
INACTIVE			
88-1021	65	—	
TOTAL:	65		

*New or revised since last month.
[1]Measured from the date of this Report.
Projects removed since last month: 88-1020.

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SWU SUPPLY AND DEMAND
(March 31, 1988)

Nuexco Project Number	Delivery Period[1] (Thousands of SWU) Spot or Near-term[2]	Intermediate or Long-term	Remarks
Available for Sale: ACTIVE			
87-1058	90	—	1988
87-1068*	200	—	1988,UF6e
88-1033B	15	—	1988
TOTAL:	305		
INACTIVE			
87-1004	55	—	1988
87-1128	300	—	1988
TOTAL:	355		
Inquiries to Purchase: ACTIVE			
88-1017B	160	—	1988, UF6e
88-1013B	40	—	1988,UF6e
88-1035B	20	—	1988, UF6e
88-1050*	—	45	1989
TOTAL:	220		
INACTIVE			
87-1065	150	—	1988
87-1154B	20	—	1988, UF6e
87-1171	130	—	1988
TOTAL:	300		

*New or revised since last month.
[1]Measured from the date of this Report.
[2] For delivery within one year. This category excludes SWU deliverable within one year under other than spot or near-term contracts.
Projects removed since last month: None.

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URANIUM PRODUCTION IN FRANCE

Introduction

France was one of the first nations to assume a leadership role in the development of nuclear power generation. The French Commission for Atomic Energy (Commissariat a l'Energie Atomique - CEA) was formed on October 18, 1945 to establish and regulate national nuclear policy, and the French program developed rapidly to include the complete nuclear fuel cycle. The CEA has since maintained an aggressive and uninterrupted program, leading the country to the forefront of nuclear technology. That the program has been a success is demonstrated by the fact that nuclear reactors currently generate over 70 percent of the electrical power in France, up from about 10 percent in 1973. There are 53 nuclear power plants now operating in France, with a combined gross power capacity of approximately 52,000 MWe.

France is fortunate to have significant uranium resources, which it has vigorously exploited. However, even those resources have proved insufficient to support France's growing nuclear program, and a combination of overseas uranium purchase contracts and equity investments in uranium production operations now supply the majority of France's uranium requirements. In fact, France has contractual or equity relationships with organizations in every major uranium-producing country, and is in the forefront of exploration activity both in established areas and in areas of new exploration. Virtually all uranium production in France now is handled by semi or fully government-owned companies, including Cogema.

Background

At the time the nuclear program was established, France had no known uranium resources. One of the CEA's most important concerns was to establish a uranium resource base sufficient to support the nuclear program, first, within France, and later, augmented by resources outside France. Thus, one of the CEA's earliest actions was to initiate uranium exploration throughout France in areas considered to be geologically favorable.

Exploration began in 1946 in the granitic rocks of the Massif Central region (Figure 1), where radioactive occurrences had been discovered during early exploration and mining of radium and associated minerals. Important discoveries at Forez in 1947 and Limousin in 1948 encouraged the rapid expansion of CEA's exploration effort. The CEA intensified its activities in the Massif Central region and other granitic complexes, including the Massif Armoricain, the Massif Vosges, and also to the sedimentary basins surrounding the Massifs, including the basins south of the Massif Central.

The CEA continued to make important discoveries throughout the early to mid-1950s and individual prospectors and private companies increasingly competed for exploration permits in France. The surge in activity resulted in new discoveries in Britanny, the Massif Central, and in Oligocene and Permian sediments. By the early 1960s, at least 70 uranium occurrences had been discovered in France. Generally, individual deposits are small, containing from about 100,000 to 2-3 million pounds U_3O_8; however, at least eight deposits are known to contain more than 10 million pounds U_3O_8.

Exploration activity decreased sharply during the period from 1963 to 1973, even though additional discoveries were made in the Massif Central region during the late 1960s. The world-wide energy crisis of 1973, however, again caused both the CEA and private companies to increase uranium exploration, both in France and in other countries. By 1976, the majority of exploration activity by the CEA and private French companies had shifted to uranium targets outside France, and the CEA was actively exploring in up to 13 foreign countries.

The more prominent private-sector companies included Pechiney Ugine Kuhlmann (PUK); Compagnie Miniere Dong-Trieu; Compagnie Francaise de Mokta (CFM, a subsidiary of Imetal); Compagnie Industrielle et Miniere (CIM, a subsidiary of Rhone Poulenc); and Total Compagnie Miniere (TCM). Two other organizations, Minatome Corp., and Elf-Aquitaine, both with almost an even split between government and private ownership, began exploring for uranium in 1975 and 1977 respectively. Thus far, only exclusively French-owned companies have participated in the French uranium industry.

Geologic Setting

The most prominent geologic feature in France is the Moldanubian Zone that extends east to west across central France. The zone is composed primarily of a granitic core with associated schists and gneisses formed by metamorphism of intruded sediments. The Massif Central constitutes the principal structural feature, forming the central highlands of France. Moldanubian Zone rocks are considered to be related to those of the Hercynian Orogeny, which have been age dated at 350 to 400 million years.

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Although Moldanubian Zone granites make up the principal uranium area of France, this area also includes structural basins containing Permian sediments which are host to uranium mineralization. The deposits at Cerilly and St. Pierre du Cantal are examples of basins directly associated with the Massif Central. The southern basins, including the important deposits in the Lodeve district, are more closely associated with the Cevenno-Vendean Zone, containing a thick sequence of Permian and Mesozoic sediments which developed along the southeastern periphery of the Moldanubian Zone.

In general, the basins formed during several stages of regional tectonics, the last of which occurred during the Alpine Orogeny of Late Cretaceous and Early Tertiary periods, estimated at 130 to 60 million years ago. Faulting and brecciation influenced the sedimentary sequence in Permian basins, and the mineral-rich solutions that formed during the weathering of volcanics and granites of the Moldanubian Zone introduced uranium mineralization into the area.

Uranium is also found in host sediments, consisting of highly carbonaceous sand/clay units of Paleogene and Eocene age, formed from the weathering of older rocks. Additional deposits have been discovered in the Aquitaine Basin which currently is being explored in considerable detail. The Paris Basin, and other basins influenced by tectonic events of the Moldanubian Zone, offer potential for new uranium deposits, and exploration is continuing in those areas. Uranium-bearing sediments also have been located in basins of the Lower Tertiary system, primarily Paleogene sediments. These sedimentary deposits are, for the most part, outside the tectonic influence of the Moldanubian Zone. The undeveloped Coutras and Trevills deposits are in this category.

Figure 1 shows the geographic location of uranium processing plants with relationship to the regional geology of France. Table 3 lists the presently operating mines supplying ore to the plants, and mines closed due to depleted reserves or unfavorable economics.

Table 2

URANIUM RESOURCES OF FRANCE, 1986*
(Millions of Pounds U_3O_8)

Reasonably Assured Resources (RAR)		Estimated Additional Resources (EAR-I)	
Recovery Cost Estimate — US$/Lb			
Up to $30	$30 to $50	Up to $30	$30 to $50
145.5	28.9	69.7	47.7
Total RAR = 174.4		Total EAR = 117.4	

*Adapted from *The French Uranium Mining Industry*, 1986, p. 57. Allowance for mining and processing losses are reflected in totals. Resource classification conforms with the publication *Uranium Resources, Production and Demand* (the Red Book), a joint report by the OECD Nuclear Energy Agency and the International Atomic Energy Agency, 1986, pages 19-26.

Uranium Resources

Uranium resources typically are classified as Reasonably Assured Resources (RAR) and Estimated Additional Resources, Category I (EAR-I). RAR includes all resources occuring in known deposits and EAR refers to additional uranium that is expected to occur based on geologic evidence. Each resource base is categorized according to estimated cost of production, that is, costs below US$30 per pound, and costs from US$30 to $50 per pound. French resources, according to industry figures published in 1986, are listed in Table 2.

Historically, discoveries of new uranium resources in France have stayed ahead of the exploitation rate. Overall, production has totaled approximately 132 million pounds U_3O_8 through 1986. Current annual production from all French uranium mines is about 8.5 million pounds U_3O_8 (3,200 MTU). Table 4 presents a summary of French uranium production for the period 1950 to 1986.

Uranium Deposits

Two rock types and two modes of occurrence characterize commercial-grade uranium mineralization in France — granitic vein-type deposits and layered sedimentary deposits.

Granitic deposits — The uranium deposits of greatest importance are associated with a metamorphic and granitic complex, referred to as the Moldanubian Zone. The mountainous highland region of the Massif Central contains the primary area of granitization and related metamorphic-phase rocks. Uranium occurs mainly in systems of veins and/or veinlets, largely confined to light-colored, course-grained and micaceous granites, along intersections of

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Table 3

URANIUM MINES AND ORE PROCESSING FACILITIES IN FRANCE (Active and Inactive)

Site (District)	Operator	Start-up (year)	Nominal Capacity (1,000 lbs. U_3O_8/Yr)	Support Mines (Operating and Closed)
L'Ecarpiere (Vendee)	Cogema	1957	1,675	*Operating* — l'Ecarpiere, Chardon, Commanderie, Roussay, Pennaran *Closed* — Chapelle, Herbiers, Retail, Dorgissiere, Prat Merien, Bonote, Quistiave
Bessines (La Crouzille)	Cogema	1958	3,900	*Operating* — Montulat, Bellezane, Fraisse, Les Gorces, Peny, Fanay, Margnac, Coussat, Hyverneresse, Les Jalerys *Closed* — Brugeaud, Chanteloube, Augeres, Venachat, Bonnac, La Betoulle, Henriette, Bauzot, Faye, Les Brosses, Lombre
Le Cellier (Lozere)	Mokta (CFM)	1977	780	*Operating* — Le Cellier, Villeret, Les Pierres, Plantees, Bondons
Bernardan (Haute-Vienne)	Total (TCM)	1979	1,300	*Operating* — Le Bernardan, Piegut, Les Loges, Gouzon, Creuse, Correze, Aveyron *Closed* — Cote-Moreau, Masgrimaud
St. Martin Du Bosc (Lodeve)	Cogema	1981	2,300	*Operating* — Mas d'Alary, Mas Lavayre. Closed — Rabejac
Bois-Noirs (Forez)	Cogema	1954	1,250	*Closed* — Bois-Noirs, (1980, mine/mill dismantled)
St. Pierre (Cantal)	Total (TCM)	1978	860	*Operating* — La Ribiere, Bertholene, (Vat leach recovery process at each site). *Closed* — St. Pierre, Chaix Maillat, Les Ballaures

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Figure 1

URANIUM PRODUCTION CENTERS IN FRANCE

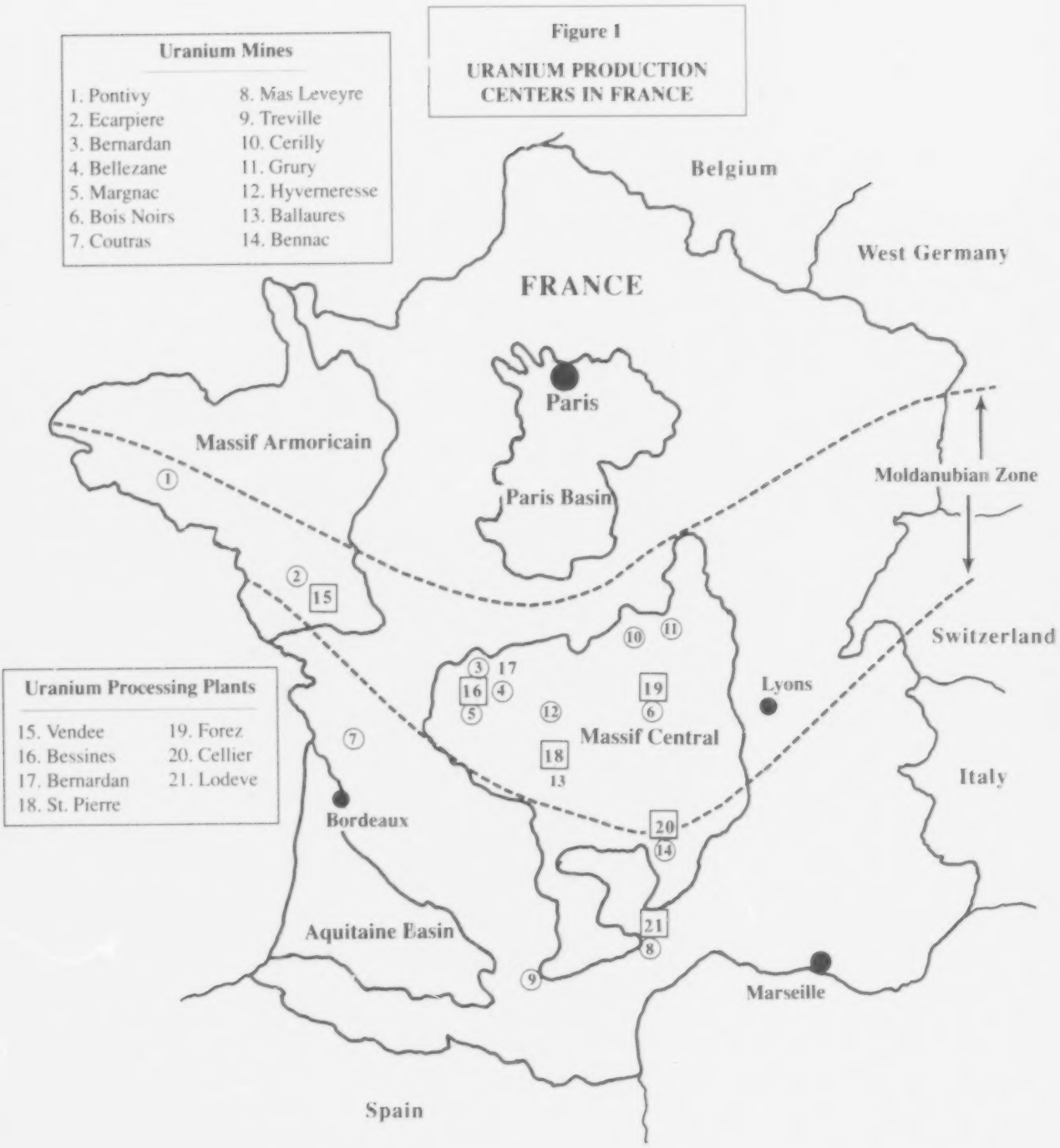

Table 4

ANNUAL PRODUCTION OF URANIUM CONCENTRATES IN FRANCE, 1950 to 1986 *

Year	Uranium Production (1,000 lbs. U_3O_8)	Year	Uranium Production (1,000 lbs. U_3O_8)
1950	78	1969	3,055
1951	104	1971	3,247
1952	130	1971	3,260
1953	169	1972	3,588
1954	156	1973	3,939
1955	286	1974	4,180
1956	455	1975	4,472
1957	975	1976	4,786
1958	1,274	1977	5,452
1959	1,924	1978	5,675
1960	2,574	1979	6,154
1961	2,938	1980	6,739
1962	2,704	1981	6,642
1963	2,678	1982	7,467
1964	2,561	1983	8,506
1965	2,595	1984	8,236
1966	2,758	1985	8,301
1967	2,862	1986	8,452
1968	2,891		

**Source- CEA*

tectonic fault and fracture systems.

The most important mineralization zones are found in conjunction with fracture systems and intersecting vein systems. Vein-type orebodies tend to be generally horizontal in shape, and may extend for a thousand meters or more in linear dimension and be up to 20 or 30 meters in thickness. Veinlet-type orebodies are usually columnar in shape and may follow the downward extension of steeply dipping fault and fracture systems for several hundred meters, commonly in a host of altered micaceous granites. The width of such an ore body may vary from a few meters to 100 meters or more. A limited amount of ore also has been mined from similar structures in metamorphic rocks, mainly schists, adjacent to granitic contacts.

Much of the uranium mineralization came from widely dispersed uranium particles scattered throughout the granites being mobilized by hydrothermal action; later precipitation and concentration took place in the favorable environments of veins. Metamorphism and extensive alteration along faults and fracture systems contributed to the mineralizing process.

Of the primary ore minerals present in the granite environment, the principal one is pitchblende, with uraninite and coffinite also occurring in significant amounts. Brannerite and uranium titanate are usually present in minor amounts. The average uranium content of the vein-type linear deposits is about 0.16-percent U_3O_8, with local values often exceeding 0.50-percent. The uranium content of veinlet-type columnar deposits averages about 0.30-percent U_3O_8, but grades exceeding 2 percent are not uncommon. Approximately 49 percent of known uranium resources in France occur in the granitic environments, and about 3 percent is in metamorphic rocks.

Sedimentary Deposits — Uranium mineralization found in detrital sedimentary formations makes up the remaining 48 percent of known uranium in France. Important ore deposits have been discovered in continental sediments of Permian and Lower Tertiary ages. The largest deposits occur in Lower Permian rocks which have been preserved in structural basins that developed off the south slope of the Massif Central, in the Lodeve district (Figure 2).

Commercial uranium deposits in Permian sediments occur in the lower sedimentary series, consisting of a basal conglomerate which is in unconformable contact with older Paleozoic and Precambrian rocks. A stratified sequence of alternating beds consisting of fine-grained carbonaceous sandstones and mudstones, and bituminous dolomites and limestones, each averaging about one meter thick, overlies the conglomerate. The uranium deposits which formed into lenticular and roll-type bodies are found between two parallel fault systems. The orebodies are confined to channels within the stratified beds, especially in sandstones and/or siltstones containing a high percentage of carbonate and bituminous material. The principal uranium minerals present are pitchblende and coffinite, in association with molybdenum and iron sulfides.

The uranium in these sedimentary deposits probably came from mineral-rich solutions generated by widespread volcanogenics. The downward migration of the solutions and precipitation of uranium (and molybdenum) are controlled by contact with bituminous material in highly altered rock. The uranium content of these Permian deposits varies from about 0.10 to 0.30-percent U_3O_8; however, values above one percent occur in the fractured and brecciated zones,

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due to mineral remobilization along planes of weakness.

The deposits in the Cerilly district are hosted in basal Permian sandstones rich in organic matter. Uranium is concentrated in the upper portion of the zone and at the interface with overlying channel fill material. The important ore minerals are pitchblende and coffinite.

Uranium also has been discovered in Lower Tertiary sediments. The first such discovery was the St. Pierre deposit at Cantal, discovered in 1955, in which mineralization was found in a highly carbonaceous sandstone of Oligocene age. The sandstone was deposited in a small structural basin in which the basement rock is highly faulted granite. The fault systems served to channel the mineral-rich solutions into contact with the carbonaceous material, which acted as a reductant to precipitate the uranium in concentrations that averaged about 0.20-percent U_3O_8. In addition, uranium has been discovered in clayey sand and clay sedimentary facies of Eocene age in the Aquitaine and Limoges basins. In both cases, the significant minerals are pitchblende and coffinite.

Government Control of Uranium Production

The development and progression of uranium exploration and mining is an extension of the French government's energy and natural resource policies. Private companies originally were in direct competition with government-sponsored companies. However, the urgency of the national program and the overall success of projects initiated by private companies have led to a realignment of company affiliations and activities through mergers, acquisitions and consolidation of companies into semi-government-owned entities. This consolidation has allowed the government to create a stronger basis for nationalization of the uranium resource base, both domestic and foreign, through control of participating companies' technology, effort and assets. At present, there are only two remaining companies, operating primarily through wholly-owned subsidiaries, that maintain an active interest in uranium projects within France. Each has government affiliations, either directly or

Figure 2. Mas Laveyre Open-pit Mine and Mill, Lodeve District, France.

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through an associate company, and each company has past ties with private industry.

The Role of Cogema

The transformation to government-controlled ownership and management began in 1976 when the CEA transferred all its exploration and mining responsibilities to a newly-formed and wholly-owned subsidiary, Cogema (Compagnie Generale des Matieres Nucleaires). Cogema assumed control of mining and milling operations in three districts of France, as well as exploration activities in France, Spain, Portugal, Zambia and Australia. In addition, the company became involved in exploration, mining and milling in Canada, Gabon, Niger and the USA. Cogema currently has controlling interest in about 30 companies involved with various aspects of the nuclear fuel cycle, including uranium exploration, mining and milling, conversion, enrichment, fuel fabrication, spent fuel reprocessing and related activities.

Cogema is the largest uranium producer in France, and its Natural Uranium Branch controls about 80 percent of France's Reasonably Assured Resources (approximately 160 million pounds U_3O_8). Cogema continues to explore for uranium in France, controlling about 60 percent of issued exploration permits, and the company operates mines and mills at the production centers of Herault, La Crouzille, and Vendee. It operates one mill directly; the two others are operated by Cogema's wholly-owned technical and engineering subsidiary Societe Industrielle des Minerais de l'Ouest (SIMO).

In June 1986, Cogema acquired a 100-percent interest in Compagnie Francaise De Mokta (CFM), one of the oldest mining companies in France. With this purchase, the last privately-owned uranium operations in France have come under government control. The acquisition also increased Cogema's uranium holdings in France, Australia and Canada. CFM continues as operator of two mines and a mill in the Lozere district of France, where it discovered uranium in 1956.

Cogema also gained full control over CFM subsidiary Societe des Mines d'Uranium du Centre (Smuc), as well as the 50-50 joint-venture formed in 1975 by CFM and the CEA to mine the Hyverneresse deposit located south of Aubusson. The CFM subsidiary Simura ceased mining in the Brittany district in early 1984 and is now inactive. Cogema also recently acquired undeveloped low-grade resources in the Correze, Gironde and Lozere areas from Compagnie Industrielle et Miniere (CIM), a Rhone Poulenc Group subsidiary. (CIM no longer has active uranium operations in France.)

Restructuring of Other Companies

The establishment of Cogema was followed by a government decree enacted on March 28, 1977 (Plan d'aide a la prospection de l'uranium), whereby privately-owned French companies became eligible to receive allowances covering 35 to 50 percent of costs related directly to uranium exploration, both in France and abroad. The plan was designed to assist high-risk exploration ventures, with the intent that the funds would be reimbursed if a commercial ore deposit were discovered and exploited. Most of the companies active in exploration took advantage of the plan, especially those with foreign ventures. Approximately 160-million francs were disbursed under the plan through 1981, the last year adequate funding was available.

Restructuring of company ownership patterns and activities began to accelerate in the late 1970s, and has continued with the uranium industry's prolonged recession. The most recent company to drop out of the uranium business because of the consolidation of French uranium interests is Societe Nationale Elf-Aquitaine Production (SNEAP). This company began exploring for uranium in France in 1977, later expanding its operations to the USA, Canada and Australia. In France, the company had an exploration permit in the Morvan St. Symphorien sector which covered the Ruaux mine site, where high-grade base metals were discovered and mined in the mid-1850s. The mine was reopened by the CEA for a short period following World War II, and a small amount of uranium was mined. SNEAP shared exploration permits with Electricite de France (EdF), through the utility's subsidiary, Societe Auxiliaire d'Energie (SAE). EdF recently has applied to the Ministry of Industry to transfer those permits to its sole ownership, in order to maintain them for possible future use.

At present, only one company, besides Cogema, remains active in uranium mining in France — Total Compagnie Miniere (TCM). TCM is a wholly-owned subsidiary of Total Compagnie Francaise Des Petroles, and has been active in uranium projects since 1954. In 1982, TCM expanded its uranium operations further by acquiring full ownership of Minatome (buying out Pechiney's 50-percent share), and Compagnie Miniere Dong-Trieu. It also has initiated exploration and mining projects in Australia, Britain, Canada, Ireland and the USA.

In France, two subsidiaries are active in exploration and mining:

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1. Compagnie Miniere Dong-Trieu (Dong-Trieu) discovered uranium ore in the Limousin/Bernardan district in the early 1970s. Mining and milling began in 1979, and annual production exceeds 1 million pounds U_3O_8 per year.

2. Societe Centrale de l'Uranium et des Minerais et Metaux Radioactifs (Scumra); since the processing plant at Saint-Pierre-du-Cantal closed in 1986, ore from mines in Creuse, Correze and Aveyron is shipped to the Dong-Trieu mill in the Bernardan district.

Exploration and Mining Permits

In France, even though the land is primarily under private ownership, the government claims ownership of all undeveloped minerals. The government controls all mineral exploration and mining activity under Article 7 of the French Mining Code. The Mining Code can be modified to cover technical and environmental conditions relating to exploitation of all minerals, usually through the adoption of special decrees. Uranium exploration, mining and reclamationn are covered by implementation of these specific decrees. Every party to exploration must have a permit before initiating any such activity.

Exploration permits — There are two types of exploration permits. The first permit is relatively easy to obtain, but offers nonexclusive and limited exploration provisions. A company, or an individual, may obtain such a permit by contracting with a land owner or owners for exploration on a given tract of land, followed by filing a declaration with the local prefect stating intention to conduct specific exploration activities (drilling may be included), and giving proof of financial capability. The Ministry of Industry gives final approval. The time required to obtain this class of permit may vary from about four months to one year. Few companies seek such permits, for the obvious reason of nonexclusivity.

An exclusive Exploration Permit is the second type available. The applicant for this permit must follow the conditions and procedures specified in Decree 80-204, dated March 11, 1980. The application must include documents of understanding with the land owner or owners, a descriptive outline of proposed exploration methods and objectives, and proof that the applicant has the technical and financial capability to complete the project.

A permit can only be authorized after a series of public hearings, inquiries and reviews with participation by the local prefect, the Ministry of Industry and Research, the General Council of Mines, and finally the Conseil d'Etat, the highest administrative court in France. The permit is actually granted by issuance of a special decree from the Conseil d'Etat, which is signed by the Prime Minister and Minister of Industry. This procedure may require one to two years, although permits have been approved within eight months. The permit is valid for three years, with two options for renewal. All minerals may be included except hydrocarbons, coal and potash, which are produced under a nationalized program. Active exploration permits in France covered approximately 12,000 km^2 in early 1986.

Mining Permits — A company holding an Exploration Permit has priority for obtaining a permit to mine. There are two types of mining permits: an *exploitation permit* and a *concession*. Each type offers exclusive rights to mine within the limits of the permit area. The principal difference between the two types concerns the project's duration. An exploitation permit is valid for five years with two options to renew, offering at least fifteen years for property development and mining. The concession is valid for 50 years and can be renewed indefinitely, affording time advantages in the event development is delayed for any reason, such as unfavorable economic and marketing conditions. Usually, from one to two years is required to secure rights to mine.

Procedures for securing these mining permits closely parallel those for exploration permits. Before the Ministry of Industry will approve a permit, a company must undergo public hearings, inquiries and reviews of the exploitation program, including approval of a Specifications and Methods document which outlines operating procedures, plus filing an acceptable environmental impact statement. However, under the provisions of Decree 330, introduced in 1980, the Conseil d'Etat reserves final approval and issuance of permits. The decree sets the conditions for project exploration, exploitation and closure of mines. The local prefect and the Corps of Mining Engineers administer all permits.

Uranium Mining and Milling

Mining — The CEA began mining uranium at the Ruaux mine (located in the Morvan district) in 1946. This was the first mining project undertaken strictly for uranium. By 1957, exploration efforts by government agencies and private industry had resulted in the discovery of the seven major uranium districts in France; five in granitic host rocks and two in sedimentary formations. Mining began in

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Figure 3. Commanderie Mine, Vendee District, France.

granitic rocks in the districts of Forez, La Crouzille, Vendee and Morvan in the early 1950s; milling of stockpiled ores began at Vendee (Figure 3) in 1957, and at La Crouzille in 1958. Mills were operating in six of the seven districts by 1981, when the Cogema mill at St. Martin du Bosc (Lodeve) began production. (The Forez mill was closed in 1980.)

Mining is carried out both by open pit and underground methods. The near-surface deposits and upper extensions of deeper deposits are mined by conventional open pit techniques. Several mines use radiometric sorters to aid mining, ore handling, stockpiling and milling. As mining is phased out, the site is reclaimed by partial backfilling of the pit, grading the upper pit walls to an acceptable slope, followed by revegetation and maintenance.

Deeper ore deposits are mined by sinking a vertical shaft and/or by driving a decline off the lower level of an open pit. Mining techniques have evolved through experience and are well adapted to the steeply dipping structural and host rock characteristics of each deposit. At some sites, mining efficiency is enhanced both by selective mining methods and by using radiometric sorters to evaluate the grade of ore being mined.

Underground mines generally use tire-mounted equipment (trackless) for greater flexibility in adapting to each ore occurrence. Using trackless equipment allows larger size machinery to be used, for greater efficiency throughout the mining process. The extensive use of wire-mesh and roof bolting for ground stabilization, rather than timber, adds to safety and operating efficiency.

Overhand mining is the most-used underground mining technique. The ore is mined from bottom to top in horizontal benches three to four meters in height; ore zone configuration or mine safety requirements determine the bench width. Ore removal is closely followed by backfilling the mined-out area with mill tailings to maintain stable ground

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conditions. The backfilled material becomes the working surface during the next horizontal pass as mining advances upward through the ore body.

In underhand mining, the operator removes steeply dipping ore from top to bottom along horizontal benches two to four meters thick and of an appropriate width. A reinforced concrete slab is then poured on the bench floor. Mining is resumed along the next lower level and the concrete slab then becomes the overhead support. After mining, each bench may be backfilled with mill tailings for stability.

At present, the depressed uranium market has forced some exploration and mining projects to slow down or shut down operations. Only high-grade mines in the lowest-cost category continue to operate; high-cost mines began closing in the early 1980s and in most cases, will remain closed until conditions improve. These high-cost projects are no longer competitive with the high-grade projects in Canada.

As a result of closing plants at Forez in 1980 and St. Pierre in 1986, plus the influence of recent company mergers, it became necessary to restructure which mines supplied ore to certain processing plants. For example, the ore from the Creuse, Correze and Aveyron mines is milled at Bernardan now that the mill at St. Pierre has closed.

Milling — During the late 1940s, the CEA initiated metallurgical testing on ores discovered at La Crouzille, Vendee, and Forez. The work was done in conjunction with private industry, including Pechiney-Ugine-Kuhlmann (PUK). From that joint effort, the CEA and PUK formed Societe Industrielle des Minerais de l'Ouest (SIMO) in 1955. SIMO built the first mill exclusively for processing domestic ores at St. Priest la Prugne (Forez district) in 1954. (Note: the processing plant built earlier by the CEA at Gueugnon in the Morvan Grury sector processed uranothorianite ore from Madagascar, and preconcentrates from the Forez district. It was closed in the early 1960s, before the mines in the Grury sector were put into production.) During the period through 1981, SIMO built four additional mills, and TCM and Dong Trieu each built one.

The first six mills use a sulfuric acid leach to liberate the uranium, followed by precipitation with ammonium or magnesium hydroxide to form ammonium diuranate or magnesium uranate. The former contains up to 75-percent U_3O_8; the latter contains not less than 70-percent U_3O_8. The seventh and newest mill, located at Lodeve, uses a mixture of sodium carbonate and bicarbonate to leach the uranium from the ore, primarily because of the calcium minerals and carbonaceous material associated with the uranium. The dissolved uranium is first precipitated by the addition of lime; final concentration to 70-percent U_3O_8 is accomplished with the addition of milk of magnesia, forming magnesium uranate.

Outlook

France is the second-largest consumer of uranium in the free world, after the USA, with annual consumption expected to increase from about 20 million pounds U_3O_8 in 1985 to almost 30 million pounds in the year 2000. A significant portion of this material will come from French participation in projects outside of France. Production from those sources currently equals, and will soon exceed, that taken from domestic production facilities. Many of those foreign projects, especially in Canada, have production costs lower than domestic projects.

Most domestic production is obtained from deposits of low to moderate ore grade, and which are not sufficiently large to achieve the economies of scale that characterize many of the foreign projects. Thus, domestic production will provide a decreasing share of French uranium requirements.

The domestic uranium industry has been effectively consolidated under government control, largely under Cogema. Given the relatively small size of French deposits, and the relatively high cost of producing uranium at those sites, whether the government will continue to keep all or even most of those production centers open in the future, much less develop new ones, is a matter of speculation.

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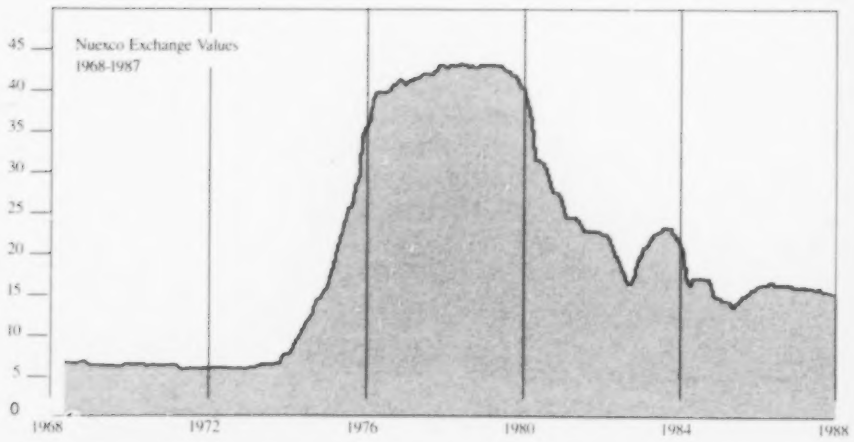
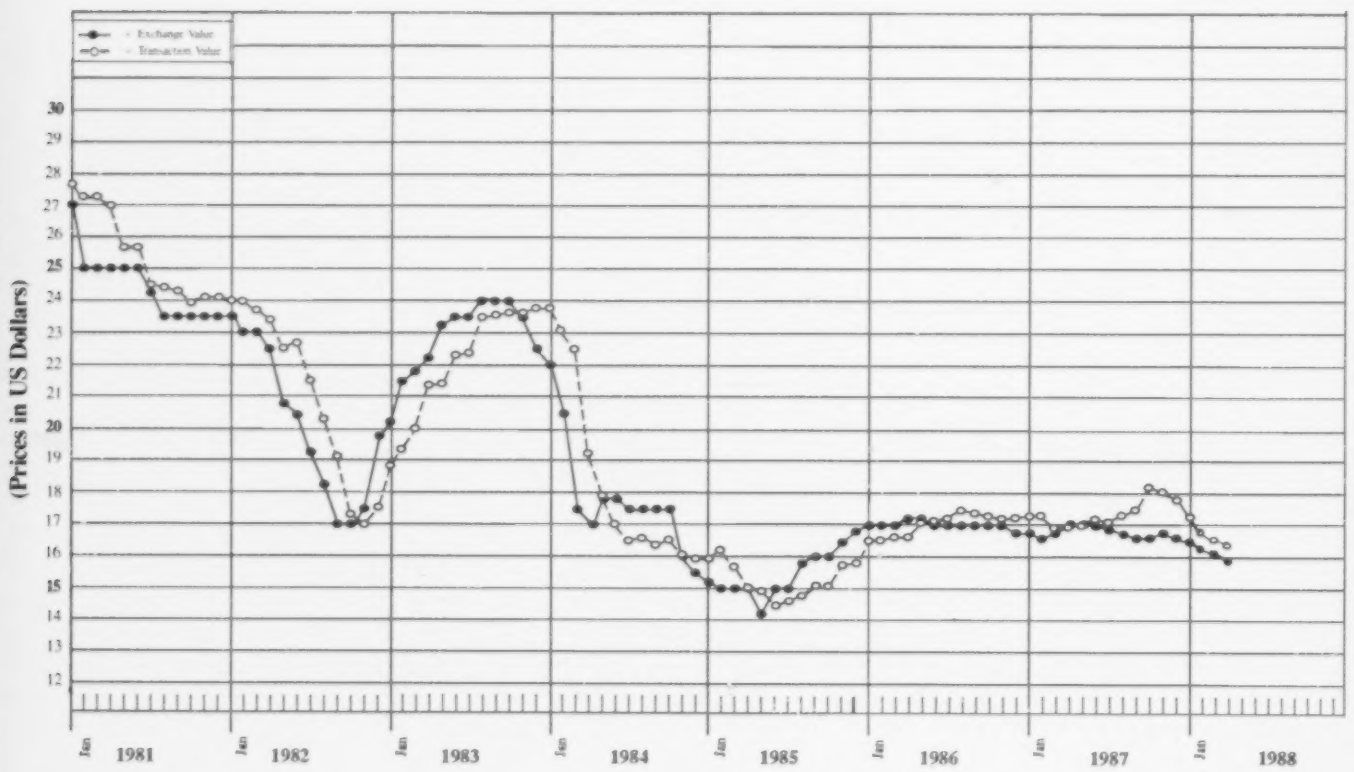
HISTORICAL MARKET DATA





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HISTORICAL EXCHANGE VALUES

Determined as of the last day of the month indicated ($US/lb. U_3O_8)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1968	—	—	—	—	—	—	—	6.35	6.35	6.40	6.45	6.50
1969	—	6.35	6.10	6.10	6.25	6.25	6.20	6.20	6.15	6.15	6.15	6.20
1970	6.30	6.30	6.30	6.30	6.30	6.30	6.30	6.20	6.15	6.15	6.15	6.15
1971	6.20	6.20	6.20	6.20	6.15	6.05	6.00	5.95	5.95	5.95	5.95	5.95
1972	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95
1973	5.95	6.00	6.10	6.20	6.45	6.50	6.50	6.50	6.50	6.50	6.75	7.00
1974	7.70	7.90	8.00	9.00	9.50	10.50	11.50	12.00	12.50	14.00	14.75	15.00
1975	16.00	16.00	18.00	20.00	21.00	23.00	24.70	26.00	26.00	28.50	30.00	35.00
1976	35.20	37.00	39.25	40.00	40.00	40.00	40.00	40.40	41.00	41.00	41.50	41.00
1977	41.35	41.50	41.60	41.60	42.00	42.25	42.25	42.25	42.40	42.75	43.20	43.20
1978	42.90	43.25	43.25	43.25	43.40	43.40	43.40	43.10	43.25	43.00	43.25	43.25
1979	43.25	43.25	43.25	43.25	43.25	43.00	42.70	42.70	42.20	42.20	41.00	40.75
1980	40.00	38.00	35.00	32.00	32.00	31.50	31.50	30.00	28.50	28.00	28.00	27.00
1981	25.00	25.00	25.00	25.00	25.00	24.25	23.50	23.50	23.50	23.50	23.50	23.50
1982	23.00	23.00	22.50	20.75	20.50	19.25	18.25	17.00	17.00	17.50	19.75	20.25
1983	21.50	21.75	22.25	23.25	23.50	23.50	24.00	24.00	24.00	23.50	22.50	22.00
1984	20.50	17.50	17.00	17.75	17.75	17.50	17.50	17.50	17.50	16.00	15.50	15.25
1985	15.00	15.00	15.00	14.25	15.00	15.00	15.75	16.00	16.00	16.50	16.75	17.00
1986	17.00	17.00	17.25	17.25	17.00	17.00	17.00	17.00	17.00	17.00	16.75	16.75
1987	16.65	16.75	17.00	17.00	17.00	16.90	16.75	16.65	16.65	16.75	16.65	16.55
1988	16.30	16.15	**15.90**									

HISTORICAL US PREMIUM (Relative to the Exchange Value)

Determined as of the last day of the month indicated ($US/lb. U_3O_8)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1986	—	—	—	—	—	—	—	—	—	—	0.65	0.75
1987	0.85	1.00	1.50	1.50	0.90	0.60	2.50	2.35	2.10	1.65	0.85	0.65
1988	0.70	0.50	**0.15**									

HISTORICAL TRANSACTION VALUES

Determined as of the last day of the month indicated ($US/lb. U_3O_8)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1976	—	—	—	—	39.60	39.70	39.70	40.40	40.30	40.60	40.70	40.70
1977	41.30	41.30	41.40	41.50	42.80	42.90	43.00	42.60	42.50	42.80	42.90	42.90
1978	43.10	43.30	43.70	43.60	43.60	43.20	43.30	43.40	43.40	43.60	43.40	43.70
1979	43.60	43.80	43.70	43.40	43.60	43.70	43.70	43.60	43.60	43.60	43.50	42.30
1980	42.00	39.30	38.60	38.40	37.90	37.60	37.30	31.30	30.60	29.00	28.70	27.70
1981	27.20	27.20	27.00	25.70	25.70	24.50	24.40	24.30	23.90	24.10	24.10	24.00
1982	24.00	23.70	23.40	22.60	22.70	21.50	20.30	19.10	17.30	17.00	17.55	18.80
1983	19.35	20.00	21.35	21.40	22.35	22.45	23.50	23.60	23.65	23.65	23.85	23.85
1984	23.05	22.50	19.25	17.90	17.00	16.50	16.60	16.40	16.55	16.05	15.90	15.90
1985	16.20	15.70	15.05	14.90	14.45	14.60	14.75	15.10	15.10	15.75	15.80	16.55
1986	16.55	16.70	16.70	17.10	17.05	17.20	17.50	17.45	17.35	17.25	17.30	17.35
1987	17.35	16.90	16.95	17.00	17.20	17.10	17.30	17.55	18.20	18.05	17.80	17.20
1988	16.85	16.65	**16.55**									

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HISTORICAL MARKET DATA

HISTORICAL CONVERSION VALUES

Determined as of the last day of the month indicated ($US/lb. U as UF_6)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1981	1.20	1.20	1.20	1.40	1.15	1.15	1.15	1.10	1.10	1.10	1.20	1.20
1982	1.20	1.20	1.20	1.20	1.00	1.00	1.00	0.90	1.10	1.60	1.45	1.45
1983	1.20	1.40	1.40	1.20	1.20	1.20	1.10	1.10	1.00	0.60	0.60	0.60
1984	0.60	0.30	0.80	0.80	0.80	0.00	0.00	0.80	1.00	1.00	0.80	0.80
1985	1.00	1.00	1.00	1.50	1.50	1.60	1.60	1.60	1.60	1.60	1.60	1.60
1986	1.60	1.80	1.90	1.80	1.80	1.80	1.80	1.90	1.90	1.90	1.80	1.80
1987	1.80	1.80	1.80	1.80	1.80	1.80	1.90	1.90	1.90	1.90	1.90	1.90
1988	1.90	1.80	**1.80**									

HISTORICAL UF_6 VALUES

Determined as of the last day of the month indicated ($US/kg. U as UF_6)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1985	—	—	—	40.50	42.50	42.50	44.00	44.50	44.50	46.00	46.00	47.00
1986	47.00	48.00	48.00	48.50	48.25	48.25	48.25	48.00	48.00	48.00	48.00	47.75
1987	47.75	48.00	48.00	48.00	47.75	47.75	47.50	47.00	46.75	47.00	47.00	47.00
1988	46.50	46.00	**45.50**									

HISTORICAL US UF_6 PREMIUM (Relative to the UF_6 Value)

Determined as of the last day of the month indicated ($US/kg U as UF_6)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1986	—	—	—	—	—	—	—	—	—	—	2.50	2.50
1987	2.50	2.50	3.50	3.00	2.25	1.75	6.50	6.00	4.25	3.10	2.25	2.00
1988	1.25	1.25	**0.50**									

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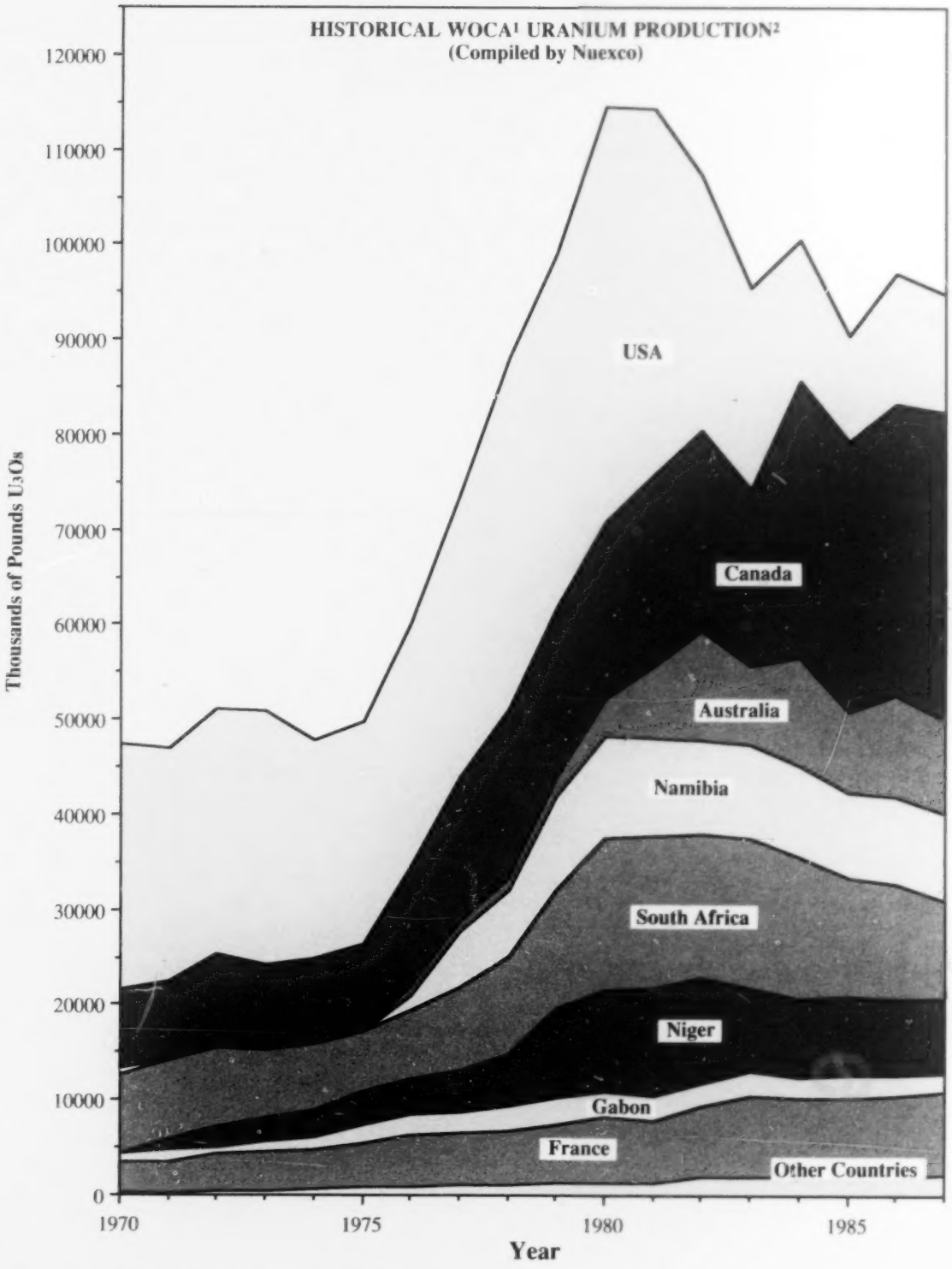

[1] WOCA = World Outside of Centrally-Planned Economic Areas.
[2] 1987 production data are preliminary.

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HISTORICAL MARKET DATA

US URANIUM MARKETING ACTIVITIES STATISTICS[1]
(Compiled from data published by the US Energy Information Administration)

Year	Total Production[2] (million pounds U_3O_8)	Deliveries to Domestic Utilities[3] (million pounds U_3O_8)	Average Price of Delivered Uranium ($/lb. U_3O_8)	Quantity of Uranium Imported[4] (million pounds U_3O_8)	Average Price of Imported Uranium ($/lb. U_3O_8)	Quantity of Uranium Exported (million pounds U_3O_8)
1976	25.5	n/a	n/a	3.6	n/a	1.2
1977	29.9	n/a	n/a	5.6	n/a	4.0
1978	37.0	n/a	n/a	5.2	n/a	6.8
1979	37.5	33.0[5]	$23.85[5]	3.0	n/a	6.2
1980	43.7	35.0[5]	$28.15[5]	3.6	$43.10	5.8
1981	38.5	32.6[5]	$34.65[5]	6.6	$32.90	4.4
1982	26.9	27.1	$38.37	17.1	$27.23[6]	6.2
1983	21.2	24.2	$38.21	8.2	$26.16	3.3
1984	14.9	22.5	$32.65	12.5	$21.86	2.2
1985	11.3	21.7	$31.43	11.7	$20.08	5.3
1986	13.5	18.9	$30.01	13.5	$20.07	1.6

[1]Sources: 1979: US Department of Energy, Assistant Secretary for Resource Applications, Office of Uranium Rresources and Enrichment, *Survey of United States Uranium Marketing Activity*, DOE/RA-0053 (Washington DC, July 1980). 1980-1981: US Department of Energy, ASsistant Secretary for Nuclear Energy, Office of Uranium Enrichment and Assessment, *Survey of United States Marketing Activity*, DOE/NE-0013 and DOE/NE-0013/1 (Washington DC, June 1981 and July 1982). 1982: Energy Information Administration, *1982 Survey of United States Marketing Activity*, DOE/EIA-0403 (Washington DC, September 1983). 1983: Energy Information Administration, *Survey of United States Marketing Activity 1983*, DOE/EIA-0403(83) (Washington DC, August 1984). 1984: Energy Information Administration, Form EIA-858, "Uranium Industry Annual Survey" (1984). 1985: Energy Information Administration, Form EIA-858, "Uranium Industry Annual Survey" (1985).

[2]Sources: 1976-11982: US Department of Energy, Grand Junction Area Office, *Statistical Data of the Uranium Industry*, GJO-100 (Grand Junction, Colorado, January 1983). 1983: Calculated by the staff of the Nuclear and Alternate Fuels Division, Office of Coal, Nuclear, Electric and Alternate Fuels, Energy Information Administration, from US Department of Energy, Grand Junction Area Office data files. 1984: Energy Information Administration, Form EIA-858, "Uranium Industry Annual Survey" (1984). 1985: Energy Information Administration, Form EIA-858, "Uranium Industry Annual Survey" (1985).

[3]Excludes direct imports by domestic utilities.

[4]Includes imports by domestic utilities and domestic suppliers.

[5]Includes delivery commitments to domestic utilities and agents.

[6]Computation of quantity-weighted average price excludes the quantity associated with a large exchange (swap) transaction that occurred in 1982.

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VOLUME AND PRICE OF URANIUM DELIVERIES TO THE EUROPEAN COMMUNITY[1]
(Compiled from data published by the Euratom Supply Agency)

Year	Volume of Deliveries to the EC[2] (in MTU)	Percentage of Deliveries Made Under Spot Contracts	Medium or Long-Term Contracts[3,4]		Spot Contracts[3,4]	
			Average Price in ECU per pound U_3O_8	Average Price in US Dollars per pound U_3O_8	Average Price in ECU per pound U_3O_8	Average Price in US Dollars per pound U_3O_8
1977	n/a	n/a	n/a	n/a	n/a	$41.00
1978	n/a	n/a	n/a	n/a	n/a	$43.00
1979	10,000	n/a	n/a	n/a	n/a	$44.50
1980	8,600	n/a	n/a	$36.00	n/a	$35.00
1981	13,000	less than 10	n/a	$33.25	n/a	$28.00
1982	12,500	less than 10	ECU 32.25	$32.00	ECU 24.25	$24.00
1983	13,500	less than 10	ECU 34.75	$31.00	ECU 26.00	$23.25
1984	11,000	less than 10	ECU 37.75	$29.75	ECU 24.50	$19.25
1985	11,000	11.5	ECU 38.00	$29.00	ECU 19.50	$15.00
1986	12,000	9.5	ECU 31.50	$31.00	ECU 18.00	$17.75

[1]The twelve European Community member nations are Belgium, Denmark, France, the Federal Republic of Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, and the United Kingdom; prior to January 1986, Spain and Portugal were not members of the EEC.

[2]The only deliveries taken into account are those made to final users, namely the electric utilities or their procurement organizations; deliveries to middlemen or fuel cycle companies are not included. The sales between utilities in the Community are also excluded. The quantities covered are those which were entered into accounting records during the year stated.

[3]For deliveries made under medium or long-term contracts (i.e., for which the time between the date of signature and the date of the last delivery exceeds one year) the prices were expressed in seven different currencies. In order to calculate an average price, these prices have been converted into European Currency Units (ECU) and US dollars. The average prices were weighted by quantity and converted on the basis of the average annual exchange rate of the different currencies against the ECU and US dollar.

[4]Exchange rates are published by European Communities Statistical Office and the International Monetary Fund.

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GOVERNMENT STATISTICS

AUSTRALIA

		Consumer Price Index[1] (1980/1981 = 100)	Price Index of Materials Used in Manufacturing Industry — All Groups[2] (1984/1985 = 100)	Award Rates of Pay Indexes Australia - Adult Males In Mining Wage Earners, Weekly Rates[3] (June 1976=100)
1975	Avg.[4]	57.9	36.3	82.1
1976	Avg.	65.7	40.7	99.7
1977	Avg.	73.8	46.3	110.8
1978	Avg.	79.7	52.0	117.7
1979	Avg.	86.9	69.5	127.9
1980	Avg.	95.8	83.1	140.8
1981	Avg.	105.0	85.9	154.1
1982	Avg.	116.7	89.0	174.9
1983	Avg.	128.5	96.9	181.9
1984	Avg.	133.6	98.0	194.4
1985	Avg.	142.6	107.3	202.7
1986	Avg.	155.5	101.5	213.0
Jan	1987	—	106.2	215.9
Feb	1987	—	108.9	216.5
Mar	1987	164.7	108.4	222.2
Apr	1987	—	108.3	222.2
May	1987	—	108.1	222.0
June	1987	167.2	108.1	222.2R
July	1987	—	108.7	222.5R
Aug	1987	—	110.5	222.2R
Sep	1987	170.0	109.3	222.8R
Oct	1987	—	108.6	223.0
Nov	1987	—	110.0	222.6
Dec	1987	—	111.9	—

P = Preliminary R = Revised since last month

[1]Weighted average of six State capital cities (1975 to 1980), and eight capital cities from 1981 (Base: Financial year July 1980 to June 1981 =100.0). Figures shown at end of quarter represent quarterly average.

[2]Australian Bureau of Statistics, Canberra: "Price Index of Materials Used in Manufacturing Industry" (Catalogue No. 6411.0).

[3]Australian Bureau of Statistics, Canberra: "Award Rates of Pay Indexes, Australia" (Catalogue No. 6312.0). Figures for the latest fourteen months shown are subject to revision.

[4]Monthly data for the period 1967 to 1986 appear in Report 233.

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CANADA

		Industrial Products Price Index: All Commodities[1] (1981 = 100)	Consumer Price Index: All Items (1981 = 100)	Wage-earner Data: Average Hourly Earnings (C$)[2]				
				Uranium Mines (SIC 057)	Metal Mines (SIC 051-059)	Mines, Quarries and Oil Wells[3] (SIC 051-099)	Metal Rolling, Casting and Extruding (SIC 298)	Chemicals and Chemical Products Industries (SIC 372-379)
1979	Avg.	80.0	80.7	—	—	—	—	—
1980	Avg.	90.7	88.9	—	—	—	—	—
1981	Avg.	100.0	100.0	—	—	—	—	—
1982	Avg.	106.7	110.8	—	—	—	—	—
1983	Avg.	110.4	117.2	17.22	—	14.18	10.67	11.10
1984	Avg.	115.4	122.3	17.89	—	14.97	11.11	11.68
1985	Avg.	118.6	127.2	18.53	16.48	15.56	11.85	12.12
1986	Avg.	119.6	132.4	19.38	16.70	15.76	12.28	12.58
Jan	1987	120.0	135.2	19.53	16.93	16.03	12.58	12.89
Feb	1987	119.8	135.8	20.33	17.20	16.21	12.66	13.11
Mar	1986	120.4	136.4	20.04	17.14	16.15	12.58	13.02
Apr	1987	121.2	137.0	20.47	17.38	16.26	11.99	13.27
May	1987	122.0	137.8	20.50	17.12	15.96	11.44	13.19
June	1987	122.5	138.2	20.23	16.94	15.70	12.77	12.88
July	1987	123.2	139.2	19.75	16.73	15.63	12.52	12.98
Aug	1987	123.8	139.3	19.64	16.98	15.87	12.65	13.03
Sep	1987	124.1R	139.3	19.85	17.20	16.25	12.57	13.40
Oct	1987	124.5R	139.8	20.06	17.31	16.33	13.01	13.37
Nov	1987	125.1	140.4	20.47	17.50	16.50	12.63	13.53
Dec	1987	125.4	140.5	20.62R	17.31R	16.37R	12.54R	13.75R
Jan	1988	126.3R	140.8	20.56P	17.51P	16.63P	12.61	13.78P
Feb	1988	125.5	141.3	—	—	—	—	—

P = Preliminary R = Revised since last month

[1]Statistics Canada, Prices Division, Ottawa: "Industry Price Indexes" (Catalogue 62-011). Indexes for the most recent six months shown are subject to revision. This category was formerly known as "Manufacturing." Monthly data for the period 1967 to 1986 is found in Report 233.

[2]Statistics Canada, Labour Division, Employment and Payrolls Section, Ottawa: "Employment, Earnings and Hours." Monthly data for the period 1983 to 1986 is found in Report 233.

[3]Reports 175 through 185 list this series title incorrectly as "Metal Mining, Including Milling (SIC 050-099)."

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GOVERNMENT STATISTICS

REPUBLIC OF SOUTH AFRICA

		Average Declared Working Costs per Metric Ton of Gold Ore Milled (Rand)[1]	Tonnage-Weighted Index of Average Working Costs per Metric Ton of Gold Ore Milled (March 1982 = 100)[2]	Consumer Price Index[3] (1985 = 100)	Production Price Index All Groups[4] (1980 = 100)	Total Employment in Mining and Quarrying[5]	Total Salaries and Wages in Mining and Quarrying (1,000 Rand)[5]
1975	Avg.	16.71	—	29.4	52.1	639,473	1,003,217
1976	Avg.	19.30	—	32.7	59.9	671,240	1,212,983
1977	Avg.	23.87	—	36.3	67.7	712,006	1,420,670
1978	Avg.	27.14	—	40.3	74.3	658,261	1,502,975
1979	Avg.	30.18	—	45.6	85.6	686,599	1,795,638
1980	Avg.	35.53	—	51.9	100.0	709,042	2,237,689
1981	Avg.	41.89	—	59.8	113.6	722,918	2,756,928
1982	Avg.	47.25	104.2	68.6	129.4	702,041	3,181,584
1983	Avg.	51.88	115.0	77.1	143.1	700,901	3,563,282
1984	Avg.	58.95	130.3	86.0	155.1	711,511	4,134,390
1985	Avg.	68.76	151.6	100.0	181.2	724,587	4,778,612
1986	Avg.	80.22	177.9	118.6	216.6	756,637	5,767,950
Jan	1987	—	—	128.9	233.9	750,496	529,682
Feb	1987	—	—	130.3	237.0	757,872	598,986
Mar	1987	88.17	197.1	132.4	239.6	762,697	536,006
Apr	1987	—	—	134.1	242.5	761,850	533,487
May	1987	—	—	135.6	243.6	759,428	530,918
Jun	1987	90.74	203.5	136.6	244.9	759,433	573,546
Jul	1987	—	—	138.2	246.8	681,409	566,232
Aug	1987	—	—	140.2	249.9	—	—
Sep	1987	100.79	224.7	142.0	252.4	—	—
Oct	1987	—	—	143.6	255.5	—	—
Nov	1987	—	—	144.8[10]	257.1	—	—
Dec	1987	100.34	267.0	145.9	258.3	—	—
Jan	1988	—	—	147.2	261.5	—	—
Feb	1988	—	—	148.2	—	—	—

P = Preliminary R = Revised since last month

[1]Chamber of Mines of South Africa, Johannesburg: "Analysis of Working Results," published quarterly. Historical Data by month appears in Report 236.

[2]Page 16 of Report 178 contains description and calculation of index, and page 24 of Report 178 lists figures for 1982.

[3]Central Statistical Service, Pretoria: All income groups-weighted average, Historical Data by month appears in Report 236.

[4]Central Statistical Service, Pretoria: All commodities for consumption in South Africa.

[5]Central Statistical Service, Pretoria: Historical Data by month appears in Report 236.

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SOUTH AFRICA

Consumer Price Index: All Income Groups — Weighted Average
1985=100

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Avg.
1967	16.8	16.8	16.9	16.9	17.0	17.0	17.1	17.2	17.2	17.1	17.1	17.1	17.0
1968	17.1	17.1	17.2	17.2	17.2	17.2	17.3	17.4	17.4	17.4	17.5	17.5	17.3
1969	17.5	17.5	17.7	17.7	17.8	17.8	17.8	17.8	17.8	18.1	18.2	18.2	17.8
1970	18.2	18.3	18.4	18.7	18.7	18.8	18.8	18.9	19.0	19.1	19.1	19.1	18.8
1971	19.2	19.2	19.4	19.7	19.8	19.9	20.0	20.1	20.2	20.3	20.4	20.5	19.9
1972	20.5	20.6	20.7	20.8	20.9	21.0	21.1	21.4	21.7	21.8	21.8	22.0	21.2
1973	22.2	22.4	22.7	22.8	23.0	23.1	23.3	23.4	23.6	23.8	24.0	24.1	23.2
1974	24.2	24.5	24.9	25.0	25.2	25.6	26.0	26.4	26.8	27.1	27.3	27.5	25.9
1975	27.9	28.1	28.3	28.7	28.9	29.3	29.6	29.9	30.1	30.4	30.6	30.8	29.4
1976	31.0	31.2	31.6	31.9	32.2	32.6	32.8	33.2	33.5	33.7	33.8	34.1	32.6
1977	34.4	34.9	35.3	35.6	35.8	36.1	36.5	37.0	37.3	37.5	37.7	37.9	36.3
1978	38.3	38.6	38.7	39.1	39.3	39.4	41.1	41.3	41.6	41.9	42.1	42.3	40.3
1979	42.7	42.9	43.7	44.0	44.2	44.8	46.4	47.1	47.6	47.9	48.0	48.2	45.6
1980	48.6	49.1	49.4	49.9	50.5	51.3	52.1	52.6	53.7	54.7	55.2	55.8	51.9
1981	56.1	57.0	57.4	57.7	58.1	58.8	60.1	61.1	62.1	62.7	63.1	63.6	59.8
1982	63.9	64.7	66.1	67.2	67.7	68.2	68.8	69.6	70.8	71.7	72.1	72.3	68.6
1983	73.2	74.4	75.2	75.8	76.3	76.6	77.2	78.0	78.6	79.3	79.8	80.3	77.0
1984	80.7	81.8	82.8	84.1	84.7	85.6	86.7	87.3	88.1	89.3	90.3	90.9	86.0
1985	92.0	94.9	95.3	97.3	98.4	99.6	100.5	101.6	102.7	104.3	105.6	107.7	100.0
1986	111.0	112.0	113.3	115.4	115.6	116.5	118.8	120.6	122.9	124.2	125.9	127.2	118.6
1987	128.9	130.3	132.4	134.1	135.6	136.6	138.2	140.2	142.0	143.6	145.9	144.8	137.7

Average Declared Working Costs Per Metric Ton of Gold Ore Milled

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Avg.
1967	-	-	6.1	-	-	6.2	-	-	6.2	-	-	6.2	6.15
1968	-	-	6.2	-	-	6.2	-	-	6.3	-	-	6.4	6.29
1969	-	-	6.4	-	-	6.4	-	-	6.4	-	-	6.5	6.41
1970	-	-	7.3	-	-	7.3	-	-	7.3	-	-	7.4	7.34
1971	-	-	7.7	-	-	7.8	-	-	7.9	-	-	8.1	7.88
1972	-	-	8.5	-	-	8.7	-	-	8.8	-	-	9.2	8.79
1973	-	-	9.4	-	-	10.3	-	-	11.0	-	-	11.4	10.51
1974	-	-	12.0	-	-	12.6	-	-	13.7	-	-	14.4	13.18
1975	-	-	15.6	-	-	16.4	-	-	17.1	-	-	17.7	16.71
1976	-	-	18.5	-	-	19.1	-	-	19.4	-	-	20.3	19.30
1977	-	-	23.0	-	-	23.2	-	-	23.9	-	-	25.4	23.87
1978	-	-	26.7	-	-	26.2	-	-	27.4	-	-	28.2	27.14
1979	-	-	28.6	-	-	29.4	-	-	30.7	-	-	31.9	30.18
1980	-	-	33.7	-	-	34.5	-	-	36.2	-	-	37.7	35.53
1981	-	-	39.3	-	-	40.4	-	-	43.3	-	-	44.5	41.89
1982	-	-	45.5	-	-	45.8	-	-	48.0	-	-	49.6	47.25
1983	-	-	50.4	-	-	50.5	-	-	52.9	-	-	53.7	51.88
1984	-	-	55.3	-	-	57.0	-	-	60.6	-	-	62.9	58.94
1985	-	-	64.5	-	-	67.4	-	-	70.5	-	-	72.4	68.76
1986	-	-	75.8	-	-	77.7	-	-	81.9	-	-	85.4	80.22
1987	-	-	88.2	-	-	90.7	-	-	100.8	-	-	-	

NUEXCO

GOVERNMENT STATISTICS

SOUTH AFRICA — EMPLOYMENT AND WAGES IN MINING AND QUARRYING

Total Employment in Mining and Quarrying

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Avg.
1977	623207	702511	706614	700532	715410	712006	707953	707521	713117	707092	692430	663668	696005
1978	620146	660111	658059	660075	666478	664571	670164	673505	670864	675595	674717	662418	663059
1979	664394	680054	689770	682505	689749	692209	699567	692377	686248	692859	699158	697741	688886
1980	699112	705758	708456	710652	717171	714379	715460	716486	710889	720246	716797	705087	711708
1981	729575	725647	705010	719674	726869	728506	735839	722684	724604	717918	720255	709612	722183
1982	700375	705992	725700	707502	715162	707552	702141	705562	704344	701316	707966	683982	705633
1983	688030	697089	695976	697158	701712	706933	704202	698984	696435	698823	695335	690750	697619
1984	683629	696332	709575	707336	703987	711511	711156	716248	721470	717865	717396	701198	708142
1985	711366	727932	708809	724187	708085	724587	741488	739205	750808	720071	750049	741372	728997
1986	743947	751823	759897	756388	754788	756637	756143	760925	765772	763953	761325	752264	756989

Total Salaries and Wages (R 1000) in Mining and Quarrying

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Avg.
1977	104876	108702	114713	117467	118499	118114	117022	121280	125491	125597	124607	124366	1420734
1978	117298	116632	121582	116945	124990	126343	134330	136428	132700	135434	136928	137561	1537171
1979	137630	136252	139717	143812	146732	152862	161450	159514	158804	162721	165956	165182	1830632
1980	171548	165790	171573	169415	179128	183739	202403	206514	204731	204602	208345	211829	2279617
1981	219969	210275	210151	217124	219880	237049	249080	245817	251502	248159	253844	257655	2820505
1982	257173	250190	262210	252562	258770	261361	283248	276730	282782	285328	287698	288019	3246071
1983	289075	281412	290586	286708	295701	300177	314566	311789	312264	313276	318344	324451	3638349
1984	320400	328787	323221	322452	322189	341350	363278	354735	359218	363755	369771	365234	4134390
1985	376777	361823	371380	369005	377524	395543	420738	418929	421369	401448	432996	425261	4772793
1986	448604	435950	445387	437563	425544	462365	516832	502968	511363	512897	531509	536970	5767952

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UNITED STATES

		Producer Price Index[1]		Consumer Price	GNP Implicit Price	Gross Average Hourly Earnings of Production or Non-supervisory Workers (US$)[4]			
		Industrial Commodities (1967 = 100)	All Commodities (1967 = 100)	Index[2] (1967 = 100)	Deflator[3] (1982 = 100)	Metal Mining (SIC 10)	Primary Non-ferrous Metals (SIC 333)	Chemicals and Allied Products (SIC 28)	Electric and Electronic Equipment (SIC 36)
1980	Avg.	274.8	268.8	246.8	85.7	10.26	10.63	8.30	6.94
1981	Avg.	304.1	293.4	272.4	94.0	11.55	11.98	9.12	7.62
1982	Avg.	312.3	299.3	289.1	100.0	12.31	12.93	9.96	8.21
1983	Avg.	315.7	303.1	298.4	103.9	12.58	13.43	10.58	8.67
1984	Avg.	322.6	310.3	311.1	107.7	13.05	13.43	11.07	9.04
1985	Avg.	323.8	308.7	322.2	111.2	13.38	13.74	11.56	9.46
1986	Avg.	312.2	299.8	328.4	114.1	13.20	13.49	11.98	9.65
Jan	1987	313.5	300.9	333.1	—	12.94	12.98	12.18	9.84
Feb	1987	314.9	302.2	334.4	—	12.99	12.83	12.21	9.84
Mar	1987	315.7	302.7	335.9	116.1	13.04	12.79	12.24	9.84
Apr	1987	317.3	305.0	337.7	—	13.16	12.90	12.30	9.82
May	1987	318.3	307.1	338.7	—	12.97	12.92	12.31	9.83
Jun	1987	319.9	308.2	340.1	117.2	13.05	12.93	12.27	9.84
Jul	1987	322.1	309.8	340.8	—	13.06	13.07	12.37	9.89
Aug	1987	323.8	310.6	342.7	—	13.03	13.07	12.34	9.90
Sep	1987	323.3	310.4	344.4	117.8	13.19	13.44	12.56	9.98
Oct	1987	324.9	311.4	345.3	—	12.96	13.06	12.52	9.95
Nov	1987	325.4	311.9	345.8	—	12.89	13.10	12.56	10.00
Dec	1987	325.3	311.7	345.7	118.7	12.78	13.14R	12.62R	10.05R
Jan	1988	104.3[5]	104.5[5]	115.7[5]	—	13.02	13.00—	12.56R	10.03R
Feb	1988	104.4	104.6	116.0	—	13.09P	12.91P	12.54P	10.04P
Mar	1988	—	——	—	—	—	—	12.52P	10.09P

P = Preliminary R = Revised since last month

[1]US Bureau of Labor Statistics, Washington, D.C.: "Producer Prices and Price Indexes," (formerly "Wholesale Prices and Price Indexes"). Producer Price Indexes are revised four months after they are first released to reflect the availability of late reports and corrections by respondents. Historical data is presented in Report 233.

[2]US Bureau of Labor Statistics, Washington, D.C.: Consumer Price Index for All Urban Consumers, US City Average, All Items. Historical data is presented in Report 233.

[3]US Department of Commerce, Washington, D.C.: Bureau of Economic Analysis, National Income and Wealth Division: "Survey of Current Business." The GNP Implicit Price Deflator is published quarterly, and seasonally adjusted. Historical data is presented in Report 233.

[4]US Bureau of Labor Statistics, Washington, D.C.: "Employment and Earnings." All data based on 1972 revision of SIC Manual. Historical data is presented in Report 233.

[5]1982 = 100.

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GOVERNMENT STATISTICS

UNITED STATES

Consumer Price Index — U.S. City Average, All Items - All Urban Consumers (Bureau of Labor Statistics) 1982-1984 = 100.0

Year	Avg.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1967	33.4	32.9	32.9	33.0	33.1	33.2	33.4	33.4	33.5	33.6	33.7	33.8	33.9
1968	34.8	34.1	34.2	34.3	34.4	34.5	34.7	34.9	35.0	35.1	35.3	35.4	35.5
1969	36.7	35.6	35.8	36.1	36.3	36.4	36.6	36.8	37.0	37.1	37.3	37.5	37.7
1970	38.8	37.8	38.0	38.2	38.5	38.6	38.8	39.0	39.0	39.2	39.4	39.6	39.8
1971	40.5	39.8	39.9	40.0	40.1	40.3	40.6	40.7	40.8	40.8	40.9	40.9	41.1
1972	41.8	41.1	41.3	41.4	41.5	41.6	41.7	41.9	42.0	42.1	42.3	42.4	42.5
1973	44.4	42.6	42.9	43.3	43.6	43.9	44.2	44.3	45.1	45.2	45.6	45.9	46.2
1974	49.3	46.6	47.2	47.8	48.0	48.6	49.0	49.4	50.0	50.6	51.1	51.5	51.9
1975	53.8	52.1	52.5	52.7	52.9	53.2	53.6	54.2	54.3	54.6	54.9	55.3	55.5
1976	56.9	55.6	55.8	55.9	56.1	56.5	56.8	57.1	57.4	57.6	57.9	58.0	58.2
1977	60.6	58.5	59.1	59.5	60.0	60.3	60.7	61.0	61.2	61.4	61.6	61.9	62.1
1978	65.2	62.5	62.9	63.4	63.9	64.5	65.2	65.7	66.0	66.5	67.1	67.4	67.7
1979	72.6	68.3	69.1	69.8	70.6	71.5	72.3	73.1	73.8	74.6	75.2	75.9	76.7
1980	82.4	77.9	78.9	80.1	81.0	81.8	82.7	82.7	83.3	84.0	84.8	85.5	86.3
1981	90.9	87.0	87.9	88.5	89.1	89.8	90.6	91.6	92.3	93.2	93.4	93.7	94.0
1982	96.5	94.3	94.6	94.5	94.9	95.8	97.0	97.5	97.7	97.9	98.2	98.0	97.6
1983	99.6	97.8	97.9	97.9	98.6	99.2	99.5	99.9	100.2	100.7	101.0	101.2	101.3
1984	103.9	101.9	102.4	102.6	103.1	103.4	103.7	104.1	104.5	105.0	105.3	105.3	105.3
1985	107.6	105.5	106.0	106.4	106.9	107.3	107.6	107.8	108.0	108.3	108.7	109.0	109.3
1986	109.6	109.6	109.3	108.8	108.6	108.9	109.5	109.5	109.7	110.2	110.3	110.4	110.5
1987	113.6	111.2	111.6	112.1	112.7	113.1	113.5	113.8	114.4	115.0	115.3	115.4	115.4

Producer Price Index — Industrial Commodities (Bureau of Labor Statistics) 1982 = 100.0

Year	Avg.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1967	32.0	31.9	31.9	31.9	31.9	31.9	31.9	31.9	32.0	32.1	32.2	32.3	32.4
1968	32.8	32.5	32.7	32.7	32.8	32.8	32.8	32.8	32.8	32.9	33.1	33.1	33.2
1969	33.9	33.4	33.6	33.7	33.8	33.8	33.8	33.8	34.0	34.1	34.3	34.4	34.5
1970	35.2	34.7	34.8	34.8	35.0	35.1	35.2	35.3	35.3	35.4	35.6	35.6	35.8
1971	36.5	35.9	36.0	36.2	36.3	36.4	36.5	36.7	36.9	36.9	36.9	36.8	37.0
1972	37.8	37.1	37.3	37.4	37.5	37.7	37.8	37.8	37.9	38.0	38.0	38.1	38.2
1973	40.3	38.4	38.8	39.3	39.8	40.1	40.3	40.4	40.6	40.8	41.1	41.7	42.3
1974	49.2	43.3	44.2	45.6	46.9	48.2	49.2	50.5	51.7	52.1	52.8	53.1	53.2
1975	54.9	53.6	53.9	54.1	54.3	54.5	54.6	54.8	55.1	55.4	56.0	56.1	56.4
1976	58.4	56.8	57.0	57.3	57.7	57.8	58.1	58.5	58.9	59.2	59.7	59.9	60.0
1977	62.5	60.3	60.9	61.4	61.9	62.2	62.3	62.7	63.1	63.3	63.7	63.8	64.1
1978	67.0	64.6	65.0	65.4	66.0	66.4	66.8	67.3	67.7	68.0	68.7	69.2	69.6
1979	75.7	70.5	71.3	72.2	73.3	74.2	74.9	76.1	77.0	78.2	79.7	80.3	81.1
1980	88.0	83.4	85.1	86.0	86.9	87.1	87.6	88.4	89.1	89.3	90.3	90.7	91.8
1981	97.4	93.3	94.7	95.9	97.2	97.6	97.7	98.1	98.4	98.4	99.0	99.0	99.3
1982	100.0	99.8	99.8	99.6	99.2	99.1	99.5	100.2	100.3	100.1	100.6	100.9	100.9
1983	101.1	100.5	100.5	100.4	100.0	100.4	100.9	101.4	101.6	101.5	102.0	101.9	102.0
1984	103.3	102.2	102.7	103.1	103.3	103.5	103.7	103.7	103.5	103.2	103.6	103.7	103.4
1985	103.7	103.4	103.2	103.3	103.7	104.2	104.0	103.9	103.7	103.2	103.8	104.0	104.1
1986	100.0	103.7	102.1	100.5	99.8	99.8	99.8	98.8	98.6	98.8	99.1	99.2	99.2
1987	102.6	100.4	100.8	101.1	101.6	101.9	102.4	103.1	103.7	103.5	104.0	104.2	104.1

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